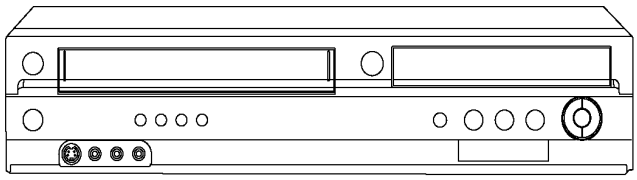
ORDER NO.VR0603001CE
B24

Service Manual

DVD Recorder



DMR-ES35VP
DMR-ES35VPC

Vol. 1

Colour

(S).....Silver Type

Notes: This model's RAM/Digital P.C.B. Module are - RFKNES35VP(P), RFKNES35VPC(PC).

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

Manufactured under license from Dolby Laboratories. “Dolby” and the double-D symbol are trademarks of Dolby Laboratories.

“DTS” and “DTS 2.0 + Digital Out” are trademarks of Digital Theater Systems, Inc.

Apparatus Claims of U.S. Patent Nos. 4,631,603, 4,577,216, and 4,819,098, licensed for limited viewing uses only.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

MPEG Layer-3 audio decoding technology licensed from Fraunhofer IIS and Thomson multimedia.

Panasonic®

© 2006 Matsushita Electric Industrial Co., Ltd. All rights reserved. Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

Page

1 Safety Precaution ... 4
1.1. General guidelines ... 4
1.2. Caution for fuse replacement ... 4
2 Warning ... 5
2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices ... 5
2.2. Precaution of Laser Diode ... 6
2.3. Service caution based on legal restrictions ... 7
3 Service Navigation ... 8
3.1. Service Information ... 8
4 Specifications ... 9
5 Location of Controls and Components ... 10
5.1. Each Buttons ... 10
6 Operation Instructions ... 12
6.1. (DVD) Taking out the Disc from RAM-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button ... 12
6.2. (VHS) Removing Cassette Tape manually ... 13
7 Service Mode ... 15
7.1. (DVD) Self-Diagnosis and Special Mode Setting ... 15
7.2. (VHS) Self-Diagnosis and Special Mode Setting ... 23
8 Service Fixture & Tools ... 29
9 Assembling and Disassembling ... 30
9.1. Disassembly Flow Chart ... 30
9.2. P.C.B. Positions ... 31
9.3. Caution with inserting cassette tape when disassembling the unit ... 32
9.4. Top Case ... 33
9.5. Front Panel ... 33
9.6. Front Jack P.C.B. & FL Drive P.C.B. ... 34
9.7. RAM / Digital P.C.B. Module ... 34
9.8. DV Jack P.C.B. ... 36
9.9. VTR Mechanism Unit ... 36
9.10. Rear Panel & Fan Motor ... 37
9.11. Power & Digital I/F P.C.B. ... 38
9.12. Main P.C.B. ... 39
10 Measurements and Adjustments ... 40
10.1. Service Positions ... 40
10.2. Caution for Replacing Parts ... 43
10.3. Standard Inspection Specifications after Making Repairs ... 46
11 Miscellaneous ... 47
11.1. Abbreviations ... 47
12 Appendix for Schematic Diagram ... 53
12.1. Voltage and Waveform Chart ... 53
13 Block Diagram ... 61
13.1. Power Supply Block Diagram ... 61
13.2. Analog Video Block Diagram ... 63

Page

13.3. Analog Audio Block Diagram ... 65
13.4. Analog Timer Block Diagram ... 66
13.5. System Control & Servo Block Diagram ... 67
14 Schematic Diagram ... 69
14.1. Interconnection Schematic Diagram ... 69
14.2. Power Supply Section (Power & Digital I/F P.C.B.(1/2)) Schematic Diagram (P) ... 71
14.3. Digital I/F (1/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF) ... 73
14.4. Digital I/F (2/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF) ... 74
14.5. Digital I/F (3/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF) ... 75
14.6. Digital I/F (4/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF) ... 76
14.7. Video (1/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V) ... 77
14.8. Video (2/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V) ... 78
14.9. Video (3/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V) ... 79
14.10. Video (4/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V) ... 80
14.11. VHS Audio Section (Main P.C.B.(2/4)) Schematic Diagram (A) ... 81
14.12. Syscon/Servo/Timer (1/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S) ... 82
14.13. Syscon/Servo/Timer (2/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S) ... 83
14.14. Syscon/Servo/Timer (3/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S) ... 84
14.15. Syscon/Servo/Timer (4/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S) ... 85
14.16. I/O Tuner Section (1/4) (Main P.C.B.(4/4)) Schematic Diagram (I) ... 87
14.17. I/O Tuner Section (2/4) (Main P.C.B.(4/4)) Schematic Diagram (I) ... 88
14.18. I/O Tuner Section (3/4) (Main P.C.B.(4/4)) Schematic Diagram (I) ... 89
14.19. I/O Tuner Section (4/4) (Main P.C.B.(4/4)) Schematic Diagram (I) ... 90
14.20. DV Jack Schematic Diagram ... 92
14.21. FL Drive Schematic Diagram ... 93
14.22. Front Jack Schematic Diagram ... 94
15 Printed Circuit Board ... 95
15.1. Power & Digital I/F P.C.B. ... 95

15.2. Main P.C.B. ---- 97
15.3. DV Jack P.C.B. ---- 102
15.4. Front Jack P.C.B., FL Drive P.C.B. ---- 103
16 Exploded Views ---- 105
16.1. Casing Parts & Mechanism Section1 ---- 105
16.2. Casing Parts & Mechanism Section 2 ---- 106
16.3. VHS Mechanism Section ---- 107
16.4. Packing & Accessories Section ---- 108
17 Replacement Parts List ---- 109

1 Safety Precaution

1.1. General guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage current cold check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2MΩ.

   When the exposed metal does not have a return path to the chassis, the reading must be ∞.

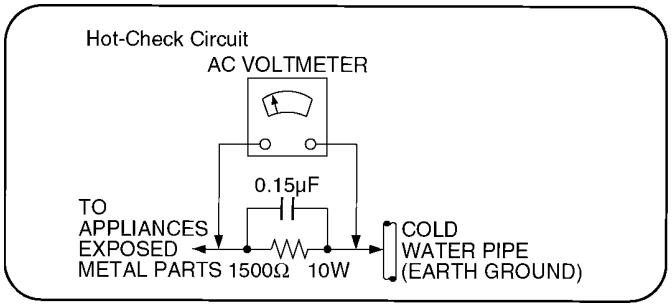


Figure 1

1.1.2. Leakage current hot check (See Figure 1 .)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15µF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliampere. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

1.2. Caution for fuse replacement

(For English)
CAUTION:

Replace with the same type fuse:
(Manufacturer: Hollyland, Type:50T, 2A, 250V)

(For Canadian French)
ATTENTION:

Utiliser un fusible de rechange de même type:
(Fabricant: Hollyland, Type: 50T, 2A, 250V)

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatic Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatic Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistor-sand semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution

   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise hamless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

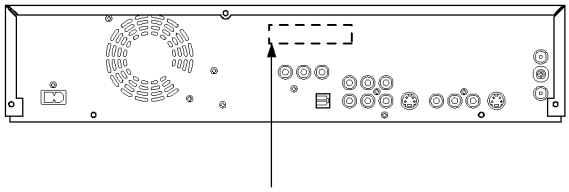
There are special components used in this equipment which are imporant for safety.
These parts are marked by ⚠ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

2.2. Precaution of Laser Diode

CAUTION:

This product utilizes a laser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wave length: 662 nm (DVDs)/780 nm (CDs)
Maximum output radiation power from pickup: 100 μ W/VDE
Laser radiation from the pickup lens is safety level,but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

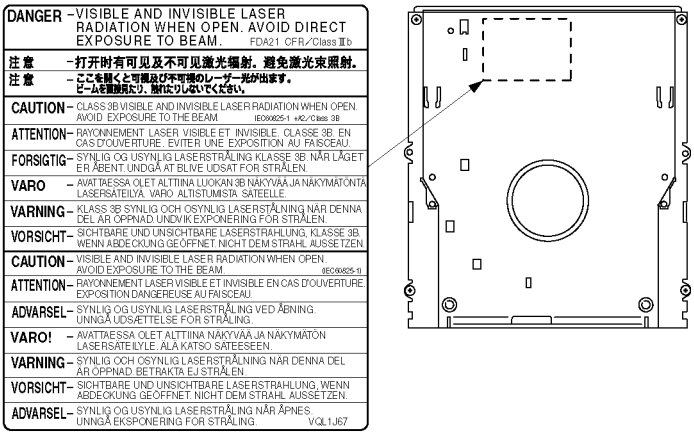


Product complies with DHHS Rules 21 CFR Subchapter J in effect at date of manufacture. Matsushita Electric Industrial Co., Ltd. Kadoma, Osaka, Japan

ACHTUNG:

Dieses Produkt enthält eine Laserdiode.
Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Laserinheit abgestrahlt.
Wellenlänge: 662 nm (DVDs)/780 nm (CDs)
Maximale Strahlungsleistung der Lasereinheit: 100 μ W/VDE
Die Strahlung der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.


DANGER – VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM. FDA21 CFR/Class IIb
注意 – 打开时有可见及不可见激光辐射。避免激光束照射。
注意 – ここを開くと可視及び不可視のレーザー光が出ます。ビームを直接見たり、触れたりしないでください。
CAUTION – CLASS 3B VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM. IEC60825-1 +A2/Class 3B
ATTENTION – RAYONNEMENT LASER VISIBLE ET INVISIBLE. CLASSE 3B. EN CAS D'OUVERTURE. EVITER UNE EXPOSITION AU FAISCEAU.
FORSIGTIG – SYNLIG OG USYNLIG LASERSTRÅLING KLASSE 3B. NÅR LÅGET ER ÅBENT. UNDGÅ AT BLIVE UDSAT FOR STRÅLEN.
VARO – AVATTAESSA OLET ALTTIINA LUOKAN 3B NÄKYVÄÄ JA NÄKYMÄTÖNTÄ LASERSÄTEILYÄ. VARO ALTISTUMISTA SÄTEELLE.
VARNING – KLASS 3B SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. UNDVIK EXPONERING FÖR STRÅLEN.
VORSICHT – SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG, KLASSE 3B. WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
CAUTION – VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM. IEC60825-1)
ATTENTION – RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
ADVARSEL – SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. UNNGÅ UDSÆTTELSE FOR STRÅLING.
VARO! – AVATTAESSA OLET ALTTIINA NÄKYVÄÄ JA NÄKYMÄTÖN LASERSÄTEILYLE. ÄLÄ KATSO SÄTEESEEN.
VARNING – SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
VORSICHT – SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
ADVARSEL – SYNLIG OG USYNLIG LASERSTRÅLING NÅR ÅPNES. UNNGÅ EKSPONERING FOR STRÅLING. VQL1J67

CAUTION!
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

2.3. Service caution based on legal restrictions

2.3.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
  (Definition: The letter of “PbF” is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.

  RFKZ03D01K----------(0.3mm 100g Reel)

  RFKZ06D01K----------(0.6mm 100g Reel)

  RFKZ10D01K----------(1.0mm 100g Reel)

Note

* Ingredient: tin (Sn), 96.5%, silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

3 Service Navigation

3.1. Service Information

This service manual contains technical information which will allow service personnel's to understand and service this model.
Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

1) This service manual does not contain the following information, because of the impossibility of sevicing at component level.

   * Schematic Diagram, Block Diagram and P.C.B. layout of RAM/Digital P.C.B. Module.
   * Parts List for individual parts of RAM/Digital P.C.B. Module.
   * Exploded View and Parts List for individual parts of RAM/Digital P.C.B. Module.

2) The following category are recycle module part. Please send them to Central Repair Center.

   * RAM/Digital P.C.B. Module (ES35VP:RFKNES35VP, ES35VPC:RFKNES35VPC)

4 Specifications

Power Supply		AC 120 V, 60 Hz
Power Consumption		Approx. 29 W
Power Consumption in standby mode		Approx. 3.2 W (Display ON) Approx. 3.0 W (Display OFF)
DVD	Recording system:	DVD-RAM: DVD Video Recording format DVD-R: DVD-Video format DVD-R DL (Dual Layer): DVD-Video format DVD-RW: DVD-Video format +R, +R DL (Double Layer), +RW
	Optical pick-up:	System with 1 lens, 2 integration units (wavelength: 662 nm for DVDs, 780 nm for CDs)
	Recordable discs:	DVD-RAM: Ver.2.0 Ver.2.1/3X-SPEED DVD-RAM Revision 1.0 Ver.2.2/5X-SPEED DVD-RAM Revision 2.0
		DVD-R: for General Ver.2.0 for General Ver.2.0/4X-SPEED DVD-R Revision 1.0 for General Ver.2.x/8X-SPEED DVD-R Revision 3.0 for General Ver.2.x/16X-SPEED DVD-R Revision 6.0 for DL Ver.3.0 for DL Ver.3.x/4X-SPEED DVD-R for DL Revision 1.0
		DVD-RW: Ver.1.1 Ver.1.1/2X-SPEED DVD-RW Revision 1.0 Ver.1.2/4X-SPEED DVD-RW Revision. 2.0
		+R: Ver.1.0 Ver.1.1 Ver.1.2 for DL Ver.1.0
		+RW: Ver.1.1 Ver.1.2/4X-SPEED
	Recording time:	Max. 8 hours (using 4.7 GB disc) XP: Approx. 1 hour SP: Approx. 2 hours LP: Approx. 4 hours EP: Approx. 6 hours/8 hours
	Playable discs:	DVD-RAM: DVD Video Recording format DVD-R: DVD-Video format DVD-R DL (Dual Layer): DVD-Video format DVD-RW: DVD-Video format, DVD Video Recording format +R, +R DL (Double Layer), +RW, DVD-Video, DVD-Audio, CD-Audio (CD-DA), Video CD, CD-R/CD-RW (CD-DA, Video CD, MP3, JPEG)
	Others:	Region code : 1
	Video:	Recording system : MPEG2 (Hybrid VBR) Output : LINE (pin jack) x 1 1.0 Vp-p; 75 ohm S connector x 1 Y: 1.0 Vp-p; 75 ohm C: 0.286 Vp-p; 75 ohm Component video output : Y,PB,PR x 1 (480i/480p) Y: 1.0 Vp-p; 75 ohm PB: 0.7 Vp-p; 75 ohm PR: 0.7 Vp-p; 75 ohm
	Audio:	Recording system : Dolby Digital (2 ch) Linear PCM (XP mode 2 ch) Analog Output : LINE (pin jack) x 1 Reference outnput : 309 mVrms FS : 2 Vrms (1kHz, 0dB) Output impedance : 1 k ohm (Load impedance : 10 k ohm) Number of channels : Recording : 2 channels Playback : 2 channels Digital Output : Digital audio optical output connector x 1 (PCM, Dolby Digital, DTS)
LASER Spec.	Class 1 LASER Product	Wave Lengh: 780 nm (CDs), 662 nm (DVDs) Laser Power: No hazardous radiation is emitted with safety protection
VHS	Recording format:	VHS Video Cassette System Standard with FM audio
	Heads:	4 helical scan heads for video 2 helical scan heads for FM audio 1 fixed head for Normal audio
	Recording modes/ recording time:	SP: 33.35 mm/s, 120min EP: 11.12 mm/s, 360 min (with T-120 cassette)

DVD / VHS Common	Video:	Input : LINE (pin jack) x 2 1.0 Vp-p; 75 ohm S connector x 2 Y: 1.0 Vp-p; 75 ohm C: 0.286 Vp-p; 75 ohm Output : LINE (pin jack) x 1 1.0 Vp-p; 75 ohm
	Audio:	Input : LINE (pin jack) x 2 Reference input : 309 mVrms FS : 2 Vrms (1kHz, 0dB) Input impedance : 22 k ohm Output : LINE (pin jack) x 1 Reference outnput : 309 mVrms FS : 2 Vrms (1kHz, 0dB) Output impedance : 1 k ohm (Load impedance : 10 k ohm) Number of track (for VHS) : HiFi : 2 track Normal : 1 track
Television system	TV system:	NTSC system, 525 lines, 60 fields
	Antena reception inputt:	TV Channel: VHF: 2ch - 13 ch UHF: 14ch - 69ch CATV Channel: 5A & A -5ch - EEEch
DV Input		IEEE 1394 Standard, 4pin x 1
Quick Start for Recording (Quick Start: ON)		1 Sec. Quick Start for Recording on DVD-RAM* *From the power off state, recording on DVD-RAM starts about 1 second after first pressing the Power button and then sequentially pressing the REC button (Quick Start Mode).
Dimensions (W) × (H) × (D)		Approx. 430 (W) × 84 (H) × 343 (D) mm [Approx. 16 15/16"(W) × 3 5/16" (H) × 13 7/8" (D)]
Mass		Approx. 5.4 kg (11.9 lbs)
Operating Temperature		5 ˚C - 40 ˚C (41 ˚F - 104 ˚F)
Operating Humidity		10%–80% RH (no condensation)
Clock unit		Quartz - controlled 12 - hour digital display
Solder		This model uses lead free solder (PbF).

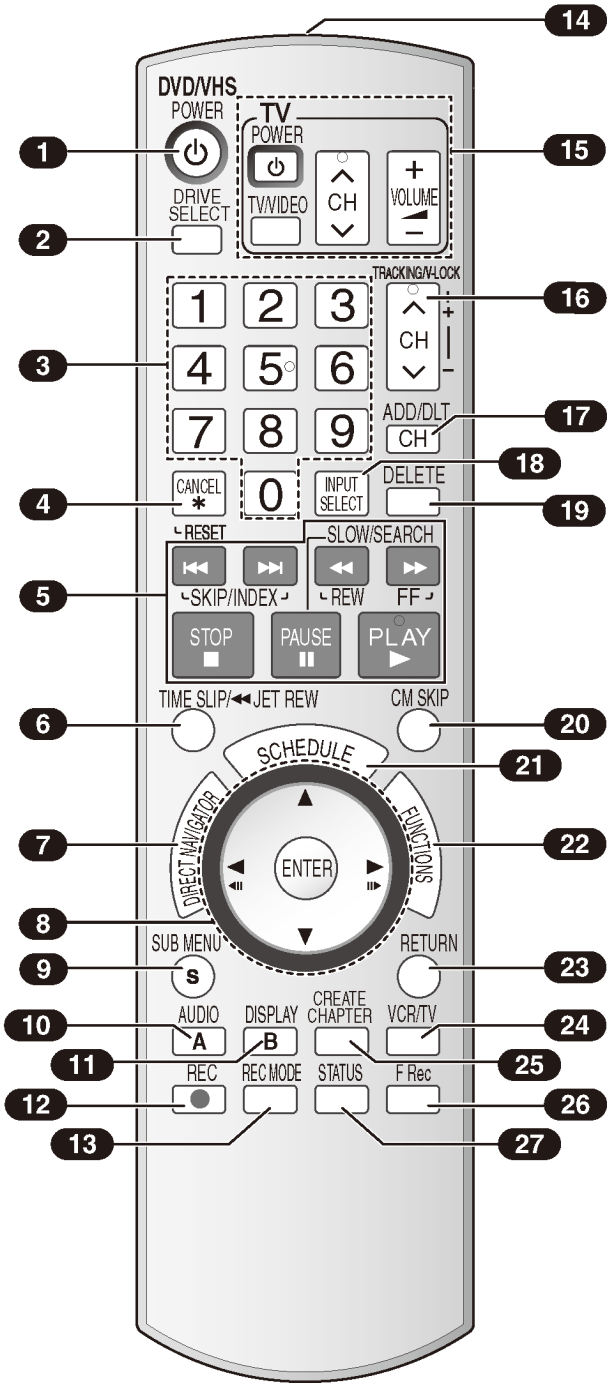
Notes: Mass and dimensions are approximate.

Specifications are subject to change without notice.

5 Location of Controls and Components

5.1. Each Buttons

Remote control



■ [DRIVE SELECT] button

- Before performing DVD operations, be sure to press the [DRIVE SELECT] button to select DVD side. Also, make sure the DVD indicator lights up on the unit.

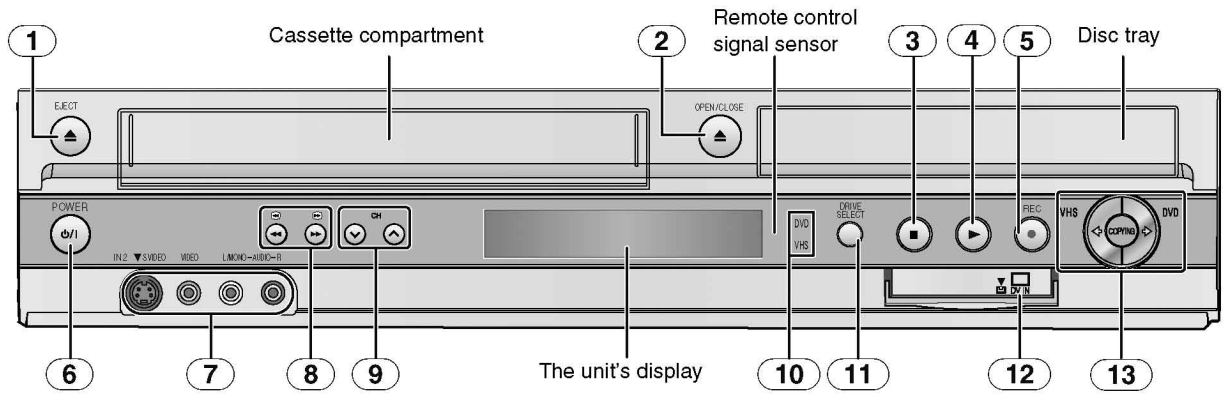
- Before performing VHS operations, be sure to press the [DRIVE SELECT] button to select VHS side. Also, make sure the VHS indicator lights up on the unit.

1. **Turn the unit on**
2. **Select drive (DVD or VHS)**
3. **Select channels and title numbers etc./Enter numbers**
4. **Cancel/Reset the tape counter**
5. **Basic operations for recording and play**
6. **Skip the specified time/ Jet rewind button (JET REW)**
7. **Direct Navigator**
8. **Selection/Enter, Frame-by-frame**
9. **Show sub menu**
10. **Select audio View select (A)**
11. **Show on-screen menu View select (B)**
12. **Start recording**
13. **Change recording mode**
14. **Transmission window**
15. **TV operations**
16. **Channel select/ TRACKING/V-LOCK**
17. **Add/delete channel**
18. **Input select (IN1, IN2, DV)**
19. **Delete items**
20. **Skip a minute forward**
21. **Show scheduled recording list**
22. **Show FUNCTIONS window**
23. **Return to previous screen**
24. **Select VCR/TV**
25. **Create chapters**
26. **Start Flexible Recording**
27. **Show status messages**

Notes

- Buttons such as the [●, REC] button do not protrude as much as other buttons to stop them from being pressed accidentally.
- The word “button” is not used in these operating instructions so “Press the [ENTER] button.” is shown as “Press [ENTER].”
- You can use this remote control to operate your TV if you set the TV manufacturer code.

Main unit



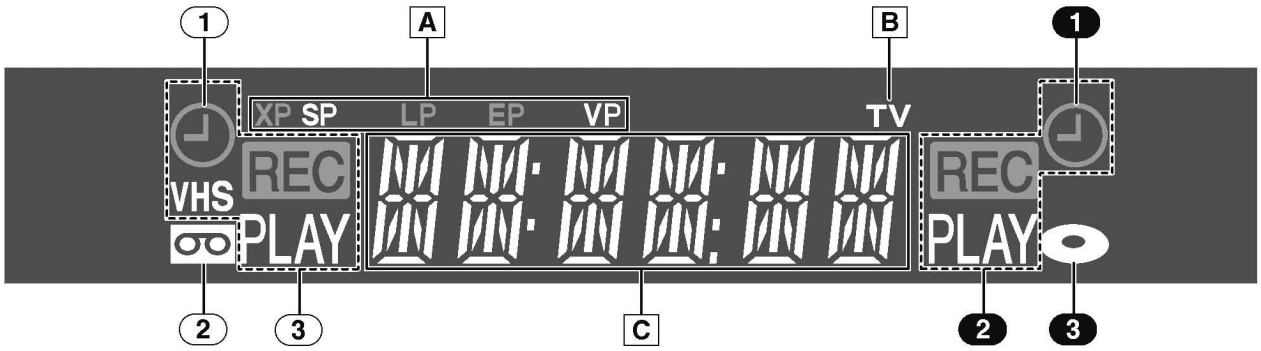
(1) **Cassette eject button (⏏, EJECT)**
(2) **Disc tray open/close button (⏏, OPEN/CLOSE)**
(3) **Stop button (■)**
(4) **Play/X1.3 button (▶)**
(5) **Recording button (●, REC)**
(6) **DVD/VHS POWER on/off button (⏻/I, POWER)**
- To switch the unit from on to standby mode or vice versa. In the standby mode, the unit is still consuming a small amount of power.

(7) **IN2 input terminals (IN2)**
(8) **DVD-SEARCH, VHS-REW/FF buttons (◀◀/◀◀, ▶▶/▶▶)**
(9) **Channel up/down buttons (CH, ∨, ∧)**
(10) **DVD/VHS drive indicator**
- Lights when the DVD or VHS drive is selected.

(11) **DRIVE SELECT button**
- Drive changes each time you press [DRIVE SELECT].

(12) **Connector for a digital video (DV) camcorder**
(13) **One Touch Transfer (copying) operation button**
- **From VHS to DVD**
- **From DVD to VHS**

The unit's display



Common to DVD/VHS

A **Recording mode indicator**
DVD:
XP, SP, LP, EP:
XP SP LP EP (all on): FR mode
VHS:
SP, LP*, EP, VP:
* Playback only

B **TV indicator**
- The indicator lights during the TV mode and it goes out during the VCR mode. You can switch the mode by using [VCR/TV].

C **Main display**
- Current time
- Disc recording and play counter
- VHS recording and play counter
- Transfer (Copying) messages
- Miscellaneous messages, etc.

VHS

(1) **Scheduled recording indicator (⏲)**
On:
When a scheduled recording program is registered and recordable tape is inserted.
Flashes:
The scheduled recording indicator flashes when the unit cannot go to scheduled recording standby (e.g. there is no tape, etc).

(2) **Tape indicator**
(3) **Tape operation status**

DVD

❶ **Scheduled recording indicator (⏲)**
On:
When a scheduled recording program is registered and a recordable disc is inserted.
Flashes:
The scheduled recording indicator flashes when the unit cannot go to scheduled recording standby (e.g. there is no disc, etc).

❷ **Disc operation status**
❸ **Disc indicator**

6 Operation Instructions

6.1. (DVD) Taking out the Disc from RAM-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

6.1.1. (DVD) Forcible Disc Eject

6.1.1.1. (DVD) When the power can be turned off.

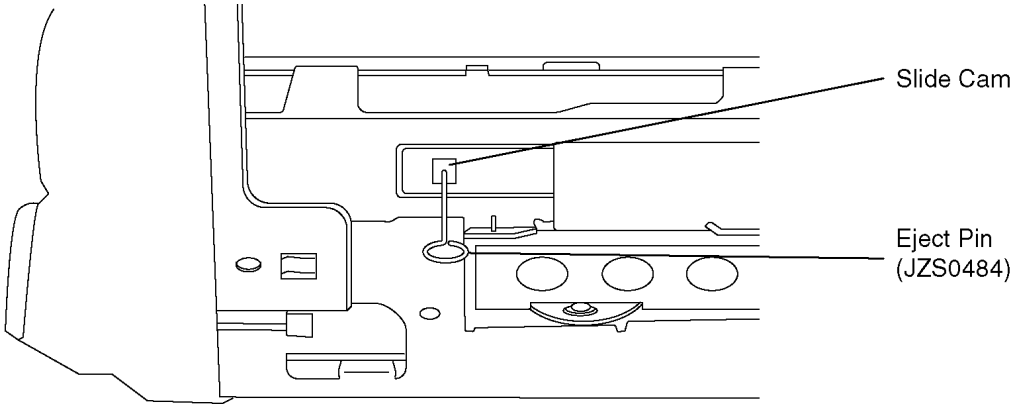
1. Turn off the power and press [STOP], [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.1.2. (DVD) When the power can not be turned off.

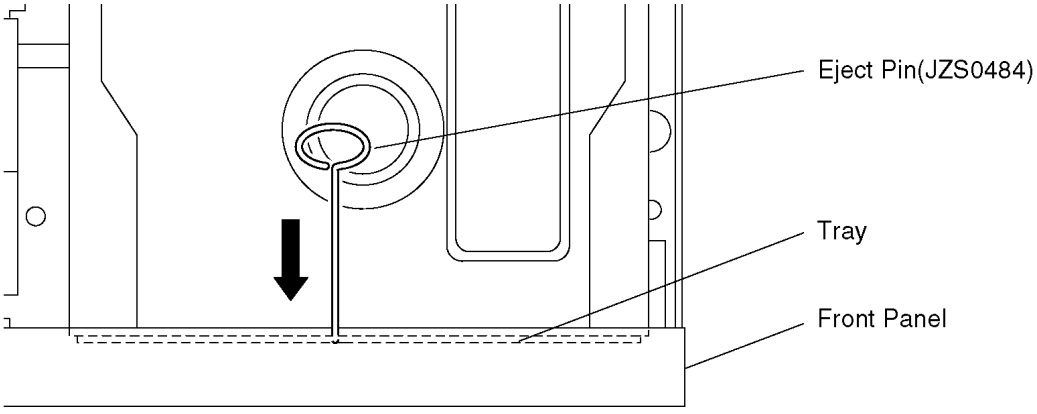
1. Press [POWER] key on the front panel for over 10 seconds to turn off the power forcibly, and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

6.1.2. (DVD) When the Forcible Disc Eject can not be done.

1. Turn off the power and pull out AC cord.
2. Remove the Top Case.
3. Push in SLIDE CAM by Eject Pin(JSJ0484) or minus screw driver (small) to eject tray slightly.



4. Push out Tray by Eject Pin (JZS0484) or minus screw driver (small).



6.2. (VHS) Removing Cassette Tape manually

When the cassette tape could not be uninstalled from an electrical malfunction, there are 2 ways to remove a cassette tape.

6.2.1. (VHS) Removal by compulsory unloading.

If Service Mode can be activated when the power can not be turned on, this operation is able.

1. Press [STOP] and [EJECT] button simultaneously for more than 3 seconds and set the Service Mode to 7.
2. Press [STOP] button in order to unload the mechanism. (Pay attention to tape slack)

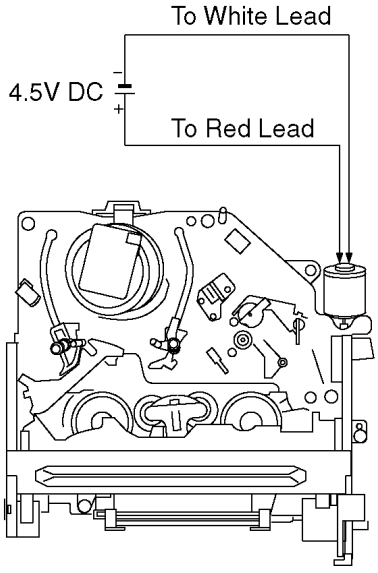
   Service Mode Display:

   7 ** ** (STOP) → 7 0L ** (EJECT)

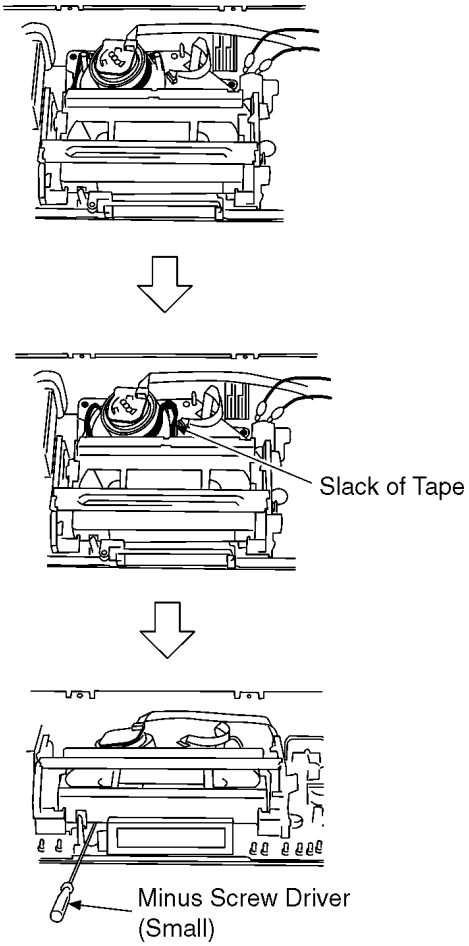
6.2.2. (VHS) Removal by manual operation by rotating the Loading Motor with the batteries.

1. Disconnect the AC plug, and remove the Top Panel and the Front Panel by referring to the Disassembly Procedures.
2. Connect three batteries (1.5V spec.) to the Loading Motor in series for supplying 4.5V to rotate the Loading Motor as shown below.

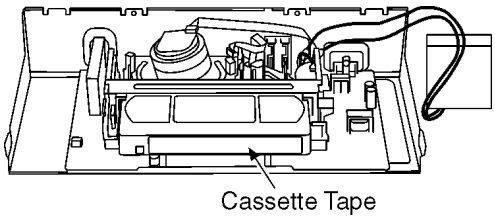
CONNECTION for UNLOADING



3. Stop unloading just before unloading will be completed as shown below, and then the tape becomes slack as shown below.
4. Rotate the S-Reel by a small minus screwdriver to remove the slack tape as shown below.

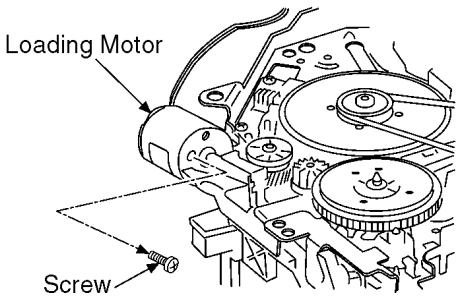


5. Then unload again to remove the cassette tape as shown below.

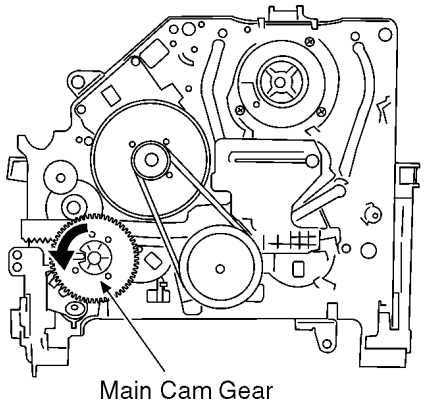


6.2.3. (VHS) Take out Cassette Tapemanually after removing the mechanism

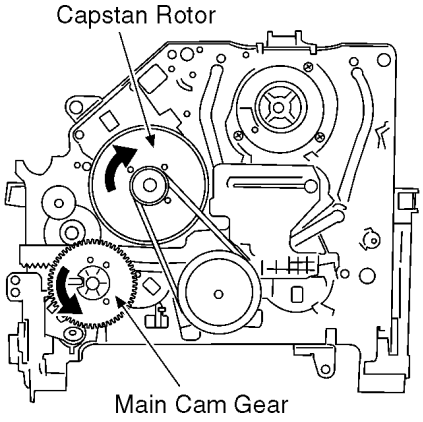
1. Disconnect the AC plug, and remove the Top Case, Front Panel and the Mechanism by referring to **"9 Assembling and Disassembling"**
2. Remove the Screw and remove the Loading Motor as shown below.



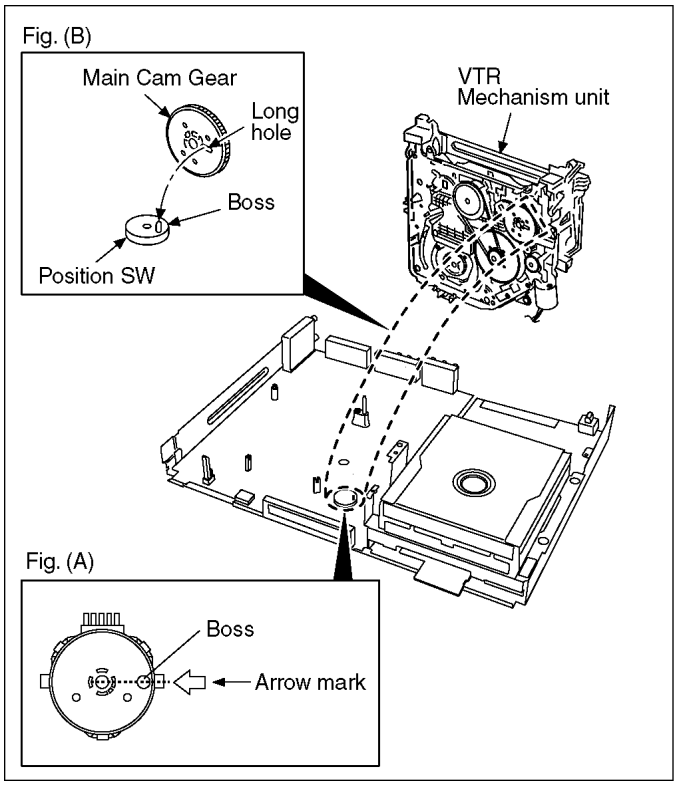
3. Rotate the Main Cam Gear counter-clockwise until just before the unloading will be completed as shown below. .



4. Rotate the Capstan Motor clockwise to remove the slack tape as shown below.
5. Rotate the Main Cam Gear counter-clockwise again to remove the cassette-tape as shown below.



6. Attach Loading Motor and tighten the screw.
7. Set the Position Switch to EJECT POSITION certainly and attach the mechanism to chassis as shown below.



7 Service Mode

7.1. (DVD) Self-Diagnosis and Special Mode Setting

7.1.1. (DVD) Self-Diagnosis Functions

Self-Diagnosis Function provides information for errors to service personnel by “Self-Diagnosis Display” when any error has occurred.

U, H** and F** are stored in memory and held.**

You can check latest error code by transmitting [0] [1] of Remote Controller in Service Mode.

Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	SET * “*” is remote controller code of the main unit. Display for 5 seconds.
U59	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 70°C. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	U59 “U59 is displayed for 30 minutes.
U61	The unit is carrying out its recovery process. (with no disc in the disc tray)	・The unit detected an error while recording or playing with no disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U61
U88	The unit is carrying out its recovery process. (with a disc in the disc tray)	・The unit detected an error while recording or playing with a disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U88
U99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	U99 Displayed is left until the [POWER] key is pressed.
H19	Inoperative fan motor	When inoperative fan motor is detected after powered on, the power is turned off automatically. The event is saved in memory.	No display	No display
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization.)	No display	No display
F09	Serial Communication Error between VHS Microprocessor and Timer Microprocessor.	Please confirm Serial Communication terminal of Microprocessor. **NOTE:** If F09 appears just after updating Firmware, pull off and insert AC plug, then it will disappear.	No display	F09
F34	Initialization error when main microprocessor is started up for program recording	When initialization error is detected after starting up main microprocessor for program recording, the power is turned off automatically. The event is saved in memory.	No display	No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F60	DVD module has not been started.	Defect of Digital P.C.B. Mode: No change	No display	F60

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
UNSUPPORT	Unsupported disc error	*An unsupported format disc was played, although the drive starts normally. *The data format is not supported, although the media type is supported. *Exceptionally in case of the disc is dirty.	**"This disc is incompatible."**	UNSUP ↓ PORT Display for 5 seconds.
NO READ	Disc read error	*A disc is flawed or dirty. *A poor quality failed to start. *The track information could not be read.	**"Cannot read. Please check the disc."**	NOREAD
HARD ERR	Drive error	The drive detected a hard error.	"**DVD drive** error."	Display for 5 seconds. HARD ↓ ERR
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / RAM drive.	No display	SELF ↓ CHECK
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. "BYE" is displayed and power will be turned off. In case "Quick Start" of setup menu is ON, it is displayed in restoration operation for AC off.	No display	PLEASE ↓ WAIT
UNFORMAT	Unformatted disc error	You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recorded on other equipment.		UNFOR ↓ MAT

7.1.2. (DVD) Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
TEST Mode	*All the main unit´s parameters (include tuner) are initialized.	TEST L1	Press [VHS to DVD DUBBING], [REC] and [OPEN/CLOSE] keys simultaneously for five seconds when power is off.
Rating password	The audiovisual level setting password is initialized to "Level 8".	INIT	Set DRIVE SELECT to [DVD]. While the tray is open, press [REC] and [PLAY] simultaneously for 5 seconds.
Service Mode	Setting every kind of modes for servicing. *Details are described in "**7.1.3. (DVD) Service Modes at a glance**".	SERV	When the power is off, press [VHS to DVD DUBBING], [OPEN/CLOSE] and [STOP] keys simultaneously for 5 seconds.
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. *When Timer REC is ON, execute " Forced disc eject " after releasing Timer REC. While Demonstration Lock is being set, this Forced disc eject function is not accepted. If this command was executed while TIMER REC is being set, TIMER REC setting will turn to OFF.	The display before execution leaves. ******	When the power is off, press [STOP] and [CH UP] keys simultaneously for 5 seconds.
Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly. *When Timer REC is ON, execute "Forced Power-off" after releasing Timer REC.	Display in P-off mode.	Press [POWER] key over than 10 seconds.

<table>
<tr><th colspan="2">Item</th><th rowspan="2">FL display</th><th>Key operation</th></tr>
<tr><th>Mode name</th><th>Description</th><th>Front Key</th></tr>
<tr><td>Aging</td><td>Perform sequence of modes as * Aging Description shown below continually.
Caution:
All programs in DVD-RAM disc will be deleted because Formatting is done once in Aging process.</td><td>Display following the then mode.</td><td>When the power is ON, press [CH DOWN], [VHS to DVD DUBBING] and [OPEN/CLOSE] simultaneously for over 5 seconds and less than 10 seconds.
NOTE1:
If Unit has not turned into Aging mode by operations shown above, execute TEST MODE once and re-execute operation shown above.
(*All the main unit's parameters include tuner are initialized by TEST mode.)
NOTE2:
If the unit has hung-up because of pressing keys for over 10 seconds, once turn off the power, and re-execute this command.
*When releasing Aging mode, press [POWER] key.</td></tr>
<tr><td colspan="4">Aging Contents (Example):
Format→REC→STOP→PLAY→CUE→REV→PLAY→PAUSE *
CLOSE←OPEN←STOP←PLAY←R-SLOW←SLOW←
*XP mode ・・・・・repeat twice
SP mode ・・・・・repeat 4 times
LP mode ・・・・・repeat 8 times
EP mode ・・・・・repeat 12 times</td></tr>
<tr><td rowspan="3">Demonstration lock/unlock</td><td rowspan="3">Ejection of the disc is prohibited.
The lock setting is effective until unlocking the tray and not released by “Main unit initialization” of service mode.</td><td>*When lock the tray.
LOCK
“LOCK” is displayed for 3 seconds.</td><td>When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
Note:
When a disc is not in tray, this setting is not effective.</td></tr>
<tr><td>*When unlock the tray.
UNLOCK
“UNLOCK” is displayed for 3 seconds.</td><td>When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.</td></tr>
<tr><td>*When press OPEN/CLOSE key while the tray being locked.
LOCK
Display “LOCK” for 3 seconds.</td><td>Press [OPEN/CLOSE] key while the tray being locked.</td></tr>
<tr><td>Progressive initialization</td><td>The progressive setting is initialized to Interlace.</td><td>The display before execution leaves.
******</td><td>When the power is on (E-E mode), press [STOP] and [VHS to DVD DUBBING] simultaneously for 5 seconds.</td></tr>
</table>

7.1.3. (DVD) Service Modes at a glance

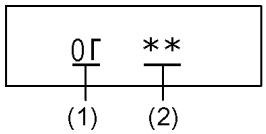
Service mode setting: While the power is off, press **[STOP], [VHS to DVD DUBBING] and [OPEN / CLOSE]** simultaneously for five seconds (OPERATION SELECT should be set to DVD).

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	SERV	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in **"7.1.1. (DVD) Self-Diagnosis Functions".**	♣□□ *♣ shows U/H/F. □□ shows number. If any error history dose not exist, [F00] is displayed.	Press [0] [1] in service mode
ROM Version Display	1. Region code (displayed for 5 sec.) 2. Main firm version (displayed for 5 sec.) 3. Timer firm version (displayed for 5 sec.) 4. Drive firm version (displayed for 5 sec.) 5. ROM correction version (displayed for 5 sec.) 6. VHS Microprocessor version (displayed for 5 sec.) 7. VHS ROM correction version (left displated)	1. NO* 2. ****** 3. ****** 4. **** 5. *** 6. **** 7. ** "" are version displays.	Press [0] [2] in service mode
White Picture Output	White picture is output as component Output from AV Decoder. *White picture (Saturation rate : 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". WHIT I	Press [1] [1] in service mode.
		Switch Interlace/Progressive WHIT	Press [1] [4] in White Picture Output mode. *I/P are switched alternately.
Magenta Picture Output	Magenta picture is output with Component Output from AV Decoder. *Magenta picture (Saturation rate: 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". MAGE I	Press [1] [2] in service mode.
		Switch Interlace/Progressive MAGE	Press [1] [4] in Magenta Picture Output mode. *I/P are switched alternately.
RTSC Return in XP (A & V)	L1 input signal is encoded (XP), decoded (XP) and output decoded signal to external without DISC recording and DISC playback.	Initial mode: EE2/ Interlace/ XP/ Audio 48kHz EE2	Press [1] [3] in service mode.
		Switch Interlace/Progressive EE2P48	Press [1] [4] in RTSC Return XP mode. *I/P are switched alternately.
		Audio 44.1 kHz/ 48 kHz Switch EE2P44	Press [2] [4] in RTSC Return XP mode. *48 kHz / 44.1 kHz are switched alternately.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
I/P Switch	Switch Interlace and Progressive in EE mode. *Initial setting is “Interlace”. *This command is effective during executing “White Picture Output”, “Magenta Picture Output” and “RTSC Return in XP (A & V)” modes.	Initial mode is Interlace SERV P Switch Interlace/Progressive SERV I	Press [1] [4] in I/P Switch mode. *I/P are switched alternately.
Audio Mute (XTMUTE)	Check whether mute is applied normally by the timer microprocessor.	T MUTE	Press [2] [1] in service mode.
Audio Mute (XDMUTE)	Check whether mute is applied normally by the Digital P.C.B..	D MUTE	Press [2] [2] in service mode.
Audio Pattern Output	The audio pattern stored in the internal memory is output (Lch: 1kHz/-18dB) (Rch: 400Hz/-18dB) *Audio sound clock switching operation of DAC can be confirmed by sub command [2] [4].	Initial mode (Audio 48kHz) AU 48	Press [2] [3] in service mode.
		Audio 44.1kHz/48kHz switching AU 44	Press [2] [4] in Audio Pattern Output mode. *48 kHz / 44.1 kHz are switched alternately.
Laser Used Time Indiction	Check laser used time (hours) of drive.	***** ●(*****) is the used time display in hour. ●Laser used time of DVD/ CD in Playback/Recording mode is counted.	Press [4] [1] in service mode.
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.	CLR	Press [9] [5] in service mode.

<table>
<tr><th colspan="2">Item</th><th rowspan="2">FL display</th><th rowspan="2">Key operation
(Remote controller key)</th></tr>
<tr><th>Mode name</th><th>Description</th></tr>
<tr><td>RAM Drive Last Error</td><td>RAM Drive error code display.
*For details about the drive error code, refer to the Service Manual for the specific RAM Drive.</td><td>1. Error Number is displayed for 5 seconds.
NO **
2. Time when the error has occurred is displayed for 5 seconds.
DDhhmm
DD: Day
hh: Hour
mm: Minute
3. Last Drive Error (1/2) is displayed for 5 seconds.
******
4. Last Drive Error (2/2) is displayed for 5 seconds.
******
5. Error occurring Disc type is displayed for 5 seconds.
******
6. Disc Maker ID is displayed for 5 seconds.
******
7. Factor of Drive Error occurring is left displayed
******</td><td>Press [4] [2] in service mode.
When “INFO******” is being displayed, past 19 error histories can be displayed by pressing [0] [1] - [1] [9]

In case that the maker cannot be identified, display is black out.</td></tr>
<tr><td>Delete the Last Drive Error</td><td>Delete the Last Drive Error information stored on the DVD RAM-Drive.</td><td>CLR</td><td>Press [9] [6] in service mode.</td></tr>
<tr><td>Laser power confirmation</td><td>Drive state is judged based on difference between laser power value at shipping and present laser power value.</td><td>CHK *
* is judgment result
<table><tr><th>*</th><th>Power value difference</th><th>Evaluation</th></tr><tr><td>0</td><td>1mW or less</td><td>Very good.</td></tr><tr><td>1</td><td>2mW or less</td><td>Good.</td></tr><tr><td>2</td><td>3mW or less</td><td>Bad.</td></tr><tr><td>3</td><td>4mW or more</td><td>Very bad.</td></tr></table>If DVD-RAM disc in not inserted, [NO DISC] is displayed.
If power value study was filed, [ERROR] is displayed.</td><td>1. Insert DVD-RAM disc into RAM Drive in service mode. (Other media are assumed to be non-correspondence.)
2. Press [4] [4].</td></tr>
<tr><td>Turn on all FL/LEDs</td><td>All segments of FL and all LEDs are turned on.</td><td>All segments are turned on.</td><td>Press [5] [1] in service mode.</td></tr>
<tr><td>S1 signal output</td><td>Forcibly superimpose the S1 signal (approx. 4.5V DC) on the EE chroma signal, and check the output on the S terminal.</td><td>S1 OUT</td><td>Press [5] [2] in service mode.</td></tr>
<tr><td>S2 signal output</td><td>Forcibly superimpose the S2 signal (approx. 2V DC) on the EE chroma signal, and check the output on the S terminal.</td><td>S2 OUT</td><td>Press [5] [3] in service mode.</td></tr>
</table>

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Front connection inspection	Press all front keys and check the connection between Main P.C.B. and Front key Switches.	 (1) Each time a key is pressed, segment turned on increases one by one. (2) Total umber of keys that have been pressed.	Press [5] [4] in service mode.
Production Date Display	Display the date when the unit was produced.	YYMMDD YY: Year MM: Month DD: Day	Press [6] [1] in service mode.
Display the accumlated working time	Display the accumulated unit´s working time.	****** (Indicating unit: Second)	Press [6] [4] in service mode.
Display the Error History	Display the Error History stored on the unit.	Display reason of error for 5 seconds. NO ** 01: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 02: Defect of RAM Drive. 03: Defect of Disc. 04: Defect of Digital P.C.B. or Communication Error. 05: Defect of Digital P.C.B. (AV DEC / MAIN CPU) Display the time when the error has occurred for 5 seconds. DDhhmm DD: Day hh: Hour mm: Minute Accumulated working time till occuring of the error is left displayed. ****** (Indicating unit: Second)	Press [6] [5] in service mode. Then press [0] [1] ~ [1] [9], the past 19 error histories are displayed.
Delete the Error History	Delete Error History information stored on the unit.	CLR	Press [9] [7] in service mode.
Tray OPEN/CLOSE Test	The RAM drive tray is opened and closed repeatedly.	****** "*" is number of open/close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.
Error code initialization	Initialization of the last error code held by timer (Write in F00)	CLR	Press [9] [8] in service mode.
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Finishing service mode	Release Service Mode.	Display in STOP (E-E) mode. ******	Press power button on the front panel or Remote controller in service mode.

7.2. (VHS) Self-Diagnosis and Special Mode Setting

7.2.1. (VHS) Self-Diagnosis Functions

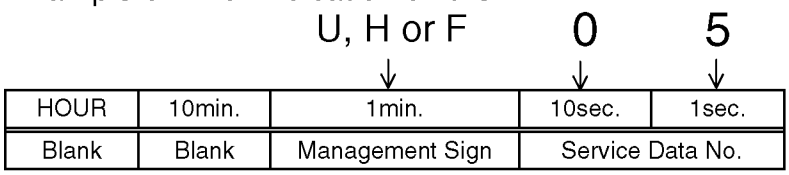
This model has a self-diagnosis and display function. If the VHS section detects trouble during installation or during use, one of the following Error Codes will automatically appear in the display on VHS side. Error Codes are displayed in the form of a single English letter followed by two numbers, as for example "H01".

Note:

1. The indication "U" is displayed on the FIP while power remains on.
2. The indication "H" or "F" is displayed on the FIP, and the power is automatically turned off. When the power is turned on again, the Error indication code will disappear and the unit will return to normal display mode (either clock or counter is displayed).
3. This Error indication code will be stored in the microprocessor even after the AC plug being disconnected.

   The two-digit number portion of the stored Error indication code can be re-displayed in "second" display portion (the last 2 digits of the FIP) by placing the unit is Service Mode Number 3 When turning on Service Data Display as for example "01" or "02" etc. If a second error occurs, the most recent error will be displayed and stored until 3 self-diagnosis histories in maximum.
4. To erase the stored Error Code data, Press FF and EJECT buttons on VCR simultaneously for over 5 seconds in Service Mode 3.

Example of Error Indication on the FIP



Division of Management

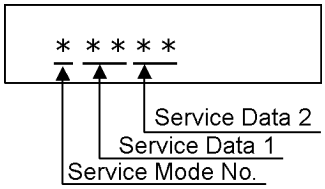
Management Sign	Management Division
U	User can deal with.
H	Shop can deal with.
F	It should be dealt with in service shop.

Error Number at a glance

Memory No. (Error No.)	Reason	Automatic display	Memory
H01	The cylinder could not be started. (Error of the cylinder or the cylinder driver.)	Yes	Yes
H02	The CAP FG could not be detected.	Yes	Yes
F03	Mechanism lock during without the unloading and the cassette-up.	Yes	Yes
F04	Mechanism lock during unloading	Yes	Yes
F05	S-reel pulse cannot be detected when a cassette tape is inserted. (Error of the S-reel system or the Capstan system.)	No	Yes
F06	Mechanism lock during the Cassette-up.	Yes	Yes
F09	Communication Error between VHS Microprocessor (IC6001) and Timer Microprocessor (IC7501)	Yes	Yes
H07	The recording circuit can not be operated in REC mode.	Yes	Yes
H08	The recording circuit is operated in except for REC mode.	Yes	Yes
U11	Cylinder clogs during the PLAY mode.	Yes	Yes
F15	S-reel pulse cannot be detected when a cassette tape is inserted. (Error of the S-reel system or the Capstan system.)	No	Yes
H16	Detection of the Cylinder lock during the constant rotation	No	Yes
H17	Detection of S-reel lock during the constant tape running	Yes	Yes
H18	Detection of T-reel lock during the constant tape running	Yes	Yes
F20	NG1 in the PG Shifter Automatic Adjustment (The cylinder rotation is unstable during the automatic adjustment.)	Yes	Yes
F21	NG2 in the PG Shifter Automatic Adjustment (The vertical sync signal is lacked while over 5 seconds on the alignment tape.)	Yes	Yes
F22	NG3 in the PG Shifter Automatic Adjustment (The installing position of Heads to the cylinder is our of specification.)	Yes	Yes
F23	NG4 in the PG Shifter Automatic Adjustment (The servo is not locked to the cylinder for more than 10 sec.)	Yes	Yes
H80	An exceptional ejection depends on a Error	No	Yes

7.2.2. (VHS) Special Modes Setting

NOTE:
OPERATION SELECT should be set to VHS.

Item		FL display	Key operation
Mode name	Description		Front Key
Tracking Center	Tape Tracking is adjusted to center FIX position.	No display.	During PLAYBACK, press [CH UP] and [CH DOWN] keys simultaneously.
VHS Service Mode	In order to make service easy, a part of inside information of a microprocessor is displayed on FIP. *Details are described in **"7.2.3. (VHS) Service Modes "**.		Press [STOP], and [EJECT] keys simultaneously for 3 seconds when power is off.
Eject	Ejecting Cassette Tape	No display.	While in other than Timer REC mode, press [STOP] key for 3 seconds or press [STOP] key of the Remote Controller for 3 seconds in VHS mode.

7.2.3. (VHS) Service Modes

<Service Mode Setting>

Set OPERATION SELECT to VHS.

When power is OFF, press [STOP] and [EJECT] keys simultaneously for 3 seconds to into Service Mode.

In Service Mode, press [STOP] and [EJECT] keys simultaneously to add Service Number.

7.2.3.1. (VHS) Service Mode and Service Data at a glance

Service Number	Contents	Contents of Indication on minute	Contents of Indication on second	Remarks
0	Indication for the inner data of IC6001	VHS mode (Real time)	Process number (Real time)	
		VCR mode (OPM)	Management number of the processing during mechanism shifting	
1	Indication for the inner data of IC6001	Starting / finishing edges detecting data (Real time)	Data of receiving key (Real time)	
		00: Both starting / finishing edges have not been 01: Starting edge is detecting now 02: Finishing edge is detecting now 03: Both starting / finishing edges are detecting now	Indicate the receiving code when the key of VCR or remote controller being operated.	

Service Number	Contents	Contents of Indication on minute	Contents of Indication on second	Remarks
2	Indication for the inner data of IC6001	Mechanism position (Real time) 0L: EJECT position 02: DOWN position 03: RREW position 04: LOAD position 05: REV position 06: PLAY position 07: POFF position 08: STOP_R position 09: STOP_F position - : FF/REW position - : Intermediate between each positions	Ordering for the Motors (Real time) 0*, 2*: CYL off, CAP off 1*: CYL off, CAP on (fwd) 3*: CYL off, CAP on (rev) 8*, A*: CYL on, CAP off 9*: CYL on, CAP on (fwd) B*: CYL on, CAP on (rev) *0: Motor off *1: Loading *2: Unloading *3: Break (Load + Unload)	There are next conditions in this mode for enable the mechanism operations without a cassette tape. ● The starting / finishing edges are not detected. ● The reel lock is not detected ● The tape and the positions are not detected. , And so on. Press the EJET key for over 3 seconds in this mode, and then the VCR is shifted into the special modes, such as PG Adjustment, Model Code Setting, and so on.
				The orders for the motors are as follows. Bit 7: CYL ON/OFF Bit 6: ---------- Bit 5: CAP FWD/REV Bit 4: CAP ON/OFF Bit 3: ---------- Bit 2: ---------- Bit 1: UNLOADING(H) Bit 0: LOADING(H)
3	Self-diagnosis history (1st)	Error number of history 1	Supplementary data 1 and 2 of history 1.	In the Self-Diagnosis Memory, next 3 BYTE is memorized for an Error. 1 BYTE: Its Error number 2 BYTE: Its supplementary data
4	Self-diagnosis history (2nd)	Error number of history 2	Supplementary data 1 and 2 of history 2.	
				In these modes, the supplementary data 3 and 4 instead of the Error number and supplementary data 1 and 2 are indicated only while pressing STOP key.
5	Self-diagnosis history (3rd)	Error number of history 3	Supplementary data 1 and 2 of history 3.	
6	Indication for the inner data of IC6001	Real time servo data (4 digits) (Real time)		
		Higher rank 1 BYTE of SERVO data	Lower rank 1 BYTE of SERVO data	
7	Manual mechanism operation	Real time mechanism position	Real time ordering for the Motors	Press the STOP key, and then the cassette tape is unloaded.
		0L: EJECT position 02: DOWN position 03: RREW position 04: LOAD position 05: REV position 06: PLAY position 07: POFF position 08: STOP_R position 09: STOP_F position - : FF/REW position - : Intermediate between each positions	0*, 2*: CYL off, CAP off 1*: CYL off, CAP on (fwd) 8*, A*: CYL on, CAP off 9*: CYL on, CAP on (fwd) B*: CYL on, CAP on (rev) *0: Motor off *1: Loading *2: Unloading *3: Break (Load + Unload)	

7.2.3.2. Example of FIP

4	0	3	1	2
HOUR	10min.	1min.	10sec.	1sec.
Service No.	Service Data 1		Service Data 2	

7.2.4. (VHS) Self-Diagnosis History Memory Function

7.2.4.1. (VHS) Condition for memorizing of the self-diagnosis history

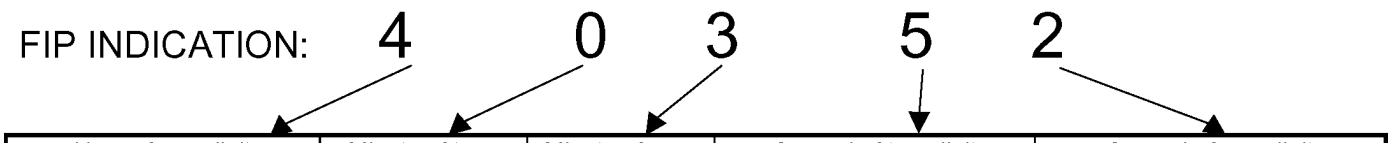
1. The self-diagnosis result and the supplementary data are the condition memorized just as an Error is detected.
2. There are the histories from number 1 to number 3.
3. The latest Error is memorized on history number 1,and then the old histories are shifted to the history number 2, 3.
4. Put out data from the memory number 3 by the shift is deleted.
5. If the latest Error is same with the history number 1 (2nd-latest), it is not memorized.
   (The same Error number is not memorized in succession)

7.2.4.2. (VHS) Condition for clearing the self-diagnosis history

1. A case of that press the FF key and the EJECT key simultaneously over 5 seconds.

7.2.4.3. (VHS) Indication of the self-diagnosis history.

1. The self-diagnosis histories and its supplementary data could be indicated on the FIP with Service mode of number from 3 to 5.
2. The procedure of setting the service mode and the format if the indication are same as usual.



Hour of one-digit	Minute of two-digit	Minute of one-digit	Second of two-digit	Second of one-digit
Service mode number	Error number		Supplementary Data	
3	Number of history 1 (The latest)		Supplementary data 1 of history 1	Supplementary data 2 of history 1
4	Number of history 2 (2nd latest)		Supplementary data 1 of history 2	Supplementary data 2 of history 2
5	Number of history 3 (3rd latest)		Supplementary data 1 of history 3	Supplementary data 2 of history 3

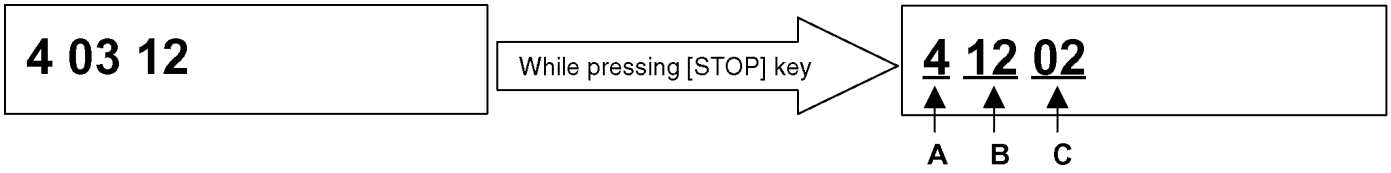
Both the Error numbers and its supplementary data of history 1, 2and 3 are indicated by selecting the Service mode 3, 4 and 5 as shown above.

In case of that any Error has not been memorized, the Error number and its supplementary data is indicated as " - ".

7.2.4.4. (VHS) Display of Supplementary Data 3 and 4

During displaying the Self-Diagnosis History, press [STOP] key on front panel to change the display.

***Example of Display**



A: Service Mode Number.

B: Supplementary Data 3...Mechanism process shifting Number.

C: Supplementary Data 4...LM(Loading Motor information)

*Display of 4 12 02 means that " Loading Motor turns ON when [EJECT] button was pressed, but an error has occurred while mechanism was between REV position and LOAD position.

<Supplementary Data 3>

[EJECT]	[FF]	[REW]
10: PLAY → passing REV 11: passing REV 12: passing REV → LOAD (Capstan STOP) 13: LOAD → DOWN 14: DOWN → EJECT 15: EJECT completion	U0: PLAY → STOP F U1: STOP F → FF U2: FF starting up	A0: PLAY → STOP F A1: STOP → REW A2: REW starting up
[PLAY]	[REC]	[STILL]
20: Cylinder starting up, Phase drawing	30: Cylinder starting up, Phase drawing	40:Turning forward
21: Audio muting, VV selection	31: REC signal output	41:Speed is 0, Capstan is OFF
[P.ON]	[STILL → PLAY]	[CUE]
-- Process of turning on power	48: Tape sending	49: x2 speed sending, Turning point of Calculating remains
[P.OFF]	[CUE → PLAY]	[REV]
70: PLAY → P.OFF	4A: Finishing edge Checking, Tape sending	80: PLAY → P.OFF
	4-: PLAY Checking, Tape sending	81: Rewinding
		P.OFF → REV

<Supplementary Data 4> (LM Information)

Result of request of driving Loading Motor.

Display	Description
1	There was no change of mechanism position. (Loading Motor was OFF)
2	There was some change of mechanism position. (Loading Motor was ON)

7.2.5. (VHS) Description of Self Diagnosis Memory

In this Self-Diagnosis Function, in case error has occurred continuously, maximum of the newest 3 error data are memorized.

And in order to analyze cause of error, the error number and the supplementary data of mode, mechanism position and so on are memorized.

7.2.5.1. (VHS) Error Number and Supplementary Data

The Supplementary Data as shown below are memorized to each error number.

Error No.	Reason	Supplementary Data			
		Data 1	Data 2	Data 3	Data 4
01	The cylinder could not be started. (Error of the cylinder or the cylinder driver.)	VHS mode	-	-	-
02	The CAP FG could not be detected.	VHS mode	-	Process No.	Number of FG
03	Mechanism lock during without the unloading and the cassette-up.	VHS mode	Standby position	Process No.	LM information
04	Mechanism lock during unloading	VHS mode	-	Process No.	LM information
05	S-reel pulse cannot be detected when a cassette tape is inserted. (Error of the S-reel system or the Capstan system.)	VHS mode	Tape position	Process No.	LM information
06	Mechanism lock during the Cassette-up.	VHS mode	Standby position	Process No.	LM information
07	The recording circuit can not be operated in REC mode.	VHS mode	-	Process No.	-
08	The recording circuit is operated in except for REC mode.	VHS mode	-	Process No.	-
09	Serial communication Error between VHS Microprocessor (IC6001) and Timer Microprocessor (IC7501).	-	-	-	-
11	Cylinder clogs during the PLAY mode.	VHS mode	-	Process No.	-
15	S-reel pulse cannot be detected when a cassette tape is inserted. (Error of the S-reel system or the Capstan system.)	VHS mode	Value of S-Reel Pulse counted	Process No.	-
16	Detection of the Cylinder lock during the constant rotation	VHS mode	Tape position	Process No.	-
17	Detection of S-reel lock during the constant tape running	VHS mode	Tape position	Process No.	Number of FG
18	Detection of T-reel lock during the constant tape running	VHS mode	Tape position	Process No.	Number of FG
20	NG1 in the PG Shifter Automatic Adjustment (The cylinder rotation is unstable during the automatic adjustment.)	VHS mode	-	Process No.	-
21	NG2 in the PG Shifter Automatic Adjustment (The vertical sync signal is lacked while over 5 seconds on the alignment tape.)	VHS mode	-	Process No.	-
22	NG3 in the PG Shifter Automatic Adjustment (The installing position of Heads to the cylinder is our of specification.)	VHS mode	-	Process No.	-
23	NG4 in the PG Shifter Automatic Adjustment (The servo is not locked to the cylinder for more than 10 sec.)	VHS mode	-	Process No.	-
80	An exceptional ejection depends on a Error	VHS mode	Refer to *Note 3	Process No.	-

Note 1: Details of "VHS mode" of the Supplementary Data 1 (These values are hexadecimal indication)

0: STOP, 1: EJECT, 2: REW, 3: FF, 4:REV, 5: CUE, 6: SLOW, 7: POWEROFF, 8: PLAY, 9: STIL,

A: REC, B: REC PAUSE, C: ADUB, D: ADUB PAUSE, E: INSERT, F: INSERT PAUSE

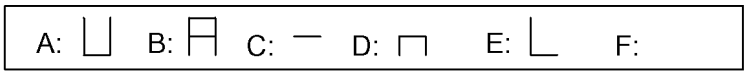
Note 2: Explanation of "Tape position" of the Supplementary Data

The Tape position Data is the area data of S-reel that is used for judgment of reducing speed in the Main microprocessor IC6001, and as the tape position is moved from the starting edge to the finishing edge, the value becomes smaller.

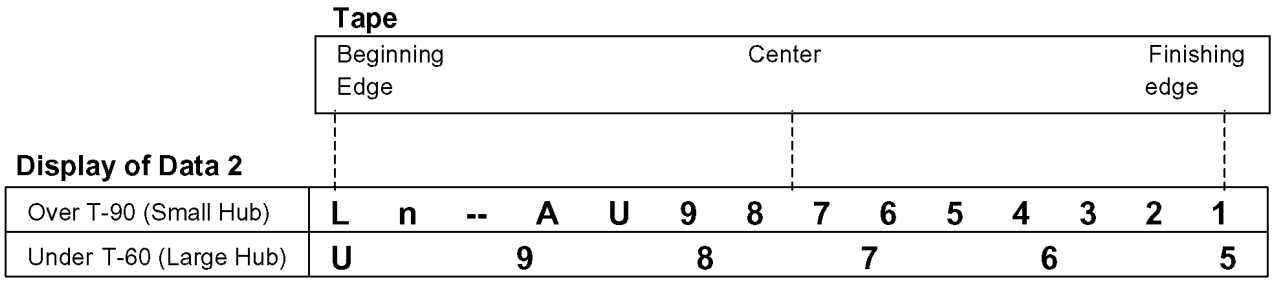
The Tape Data does not become "0" even if the tape reaches the finishing edge as the hub remains, and the tape position values are different between the large hub and the small hub as the each diameters are different from each other.

Tape Type	The aim of Tape position between the starting edge and the finishing edge
60 min. or less type (Large Hub)	The Tape position is divided into 6 stages between the Tape beginning edge: "A " and the Tape end edge: "5".
90 min. or over type (Small Hub)	The Tape position is divided into 14 stages between the Tape beginning edge: "E " and the Tape end edge: "1".

- "A" and "E" is hexadecimal. "A" =10 (Decimal), "E" =14 (Decimal).
- Hexadecimal indication from "A" to "E" are shown below.



Tape position and Display


Tape
Beginning Edge
Center
Finishing edge
Display of Data 2
Over T-90 (Small Hub)
L n -- A U 9 8 7 6 5 4 3 2 1
Under T-60 (Large Hub)
U 9 8 7 6 5

Note 3: Supplementary Data 2 (Reason of Ejection)

Supplementary Data 2	Reason
1	S-reel pulse is less than 3 when the loading has been completed. (Miss catching the tape)
2	Pulse Timer over during the short rewind at the DOWN position. (Error of S-photo sensor system, S-reel system, Capstan system)
3	Mechanism lock from the DOWN position to the LOAD position during the loading.
4	Both ends have been detected at the LOAD position when the loading is started.

8 Service Fixture & Tools

(For DVD)

Part Number	Description	Compatibility
RFKZ0168	Extension Cable (Power & Digital I/F P.C.B. - FAN / 3 Pin)	Same as E50 / ES30V / ES40V Series
RFKZ0327	Extension Cable (Main P.C.B. - Power & Digital I/F P.C.B. / 15 Pin / 40 mm)	Same as ES40V Series
RFKZ0240	Extension Cable (Main P.C.B. - Power & Digital I/F P.C.B. / 19 Pin / 40 mm)	Same as ES75V / ES30V / ES40V Series
RFKZ0368	Extension Cable (Main P.C.B. - Power & Digital I/F P.C.B. / 11 Pin / 40 mm)	New
RFKZ0215	Extension Cable (Main P.C.B. - FL Drive P.C.B. / 12 Pin)	Same as ES15 / E55 / ES30V / ES40V Series
RFKZ0239	Extension Cable (Main P.C.B. - Front Jack P.C.B. / 10 Pin)	Same as E75V / ES30V Series
RFKZ0365	Extension Cable (Main P.C.B. - RAM / Digital P.C.B. Module / 64 Pin)	Same as ES15 Series
JZS0484	Eject Pin	Same as ES15 / E50 Series
RFKZ03D01K	Lead Free Solder (0.3mm/100g Reel)	Same as ES15 Series
RFKZ06D01K	Lead Free Solder (0.6mm/100g Reel)	Same as ES15 Series
RFKZ10D01	Lead Free Solder (1.0mm/100g Reel))	Same as ES15 Series
RFKZ0316	Solder Remover (Lead free 10W temperature Solder/180g)	Same as ES15 Series
RFKZ0328	Flux	Same as ES15 Series
RFKZ0329	Bottle of Flux	Same as ES15 Series

(For VHS)

Part Number	Description	Compatibility
VFM8080HQFP	NTSC VHS Alignment Tape	Same as E75V / ES30V / ES40V
VFK0329	Post Adjustment Screwdriver	Same as E75V / ES30V / ES40V
VFK0330	Fine Adjustment Gear Driver	Same as E75V / ES30V / ES40V

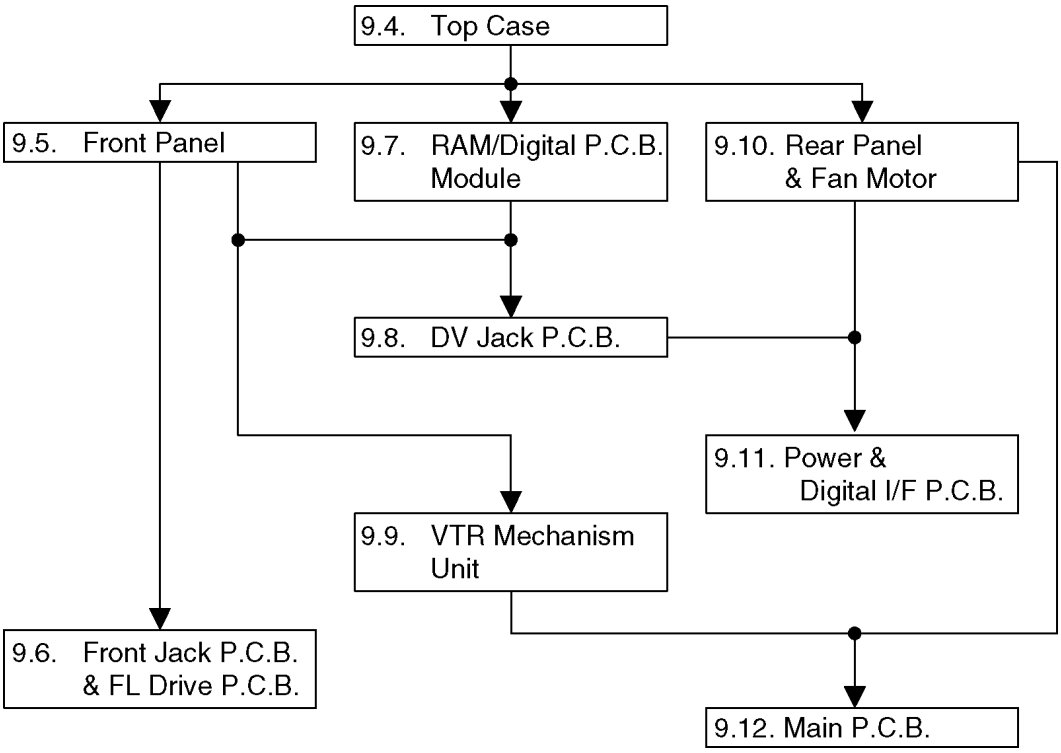
9 Assembling and Disassembling

Caution:
Original screws should be used.

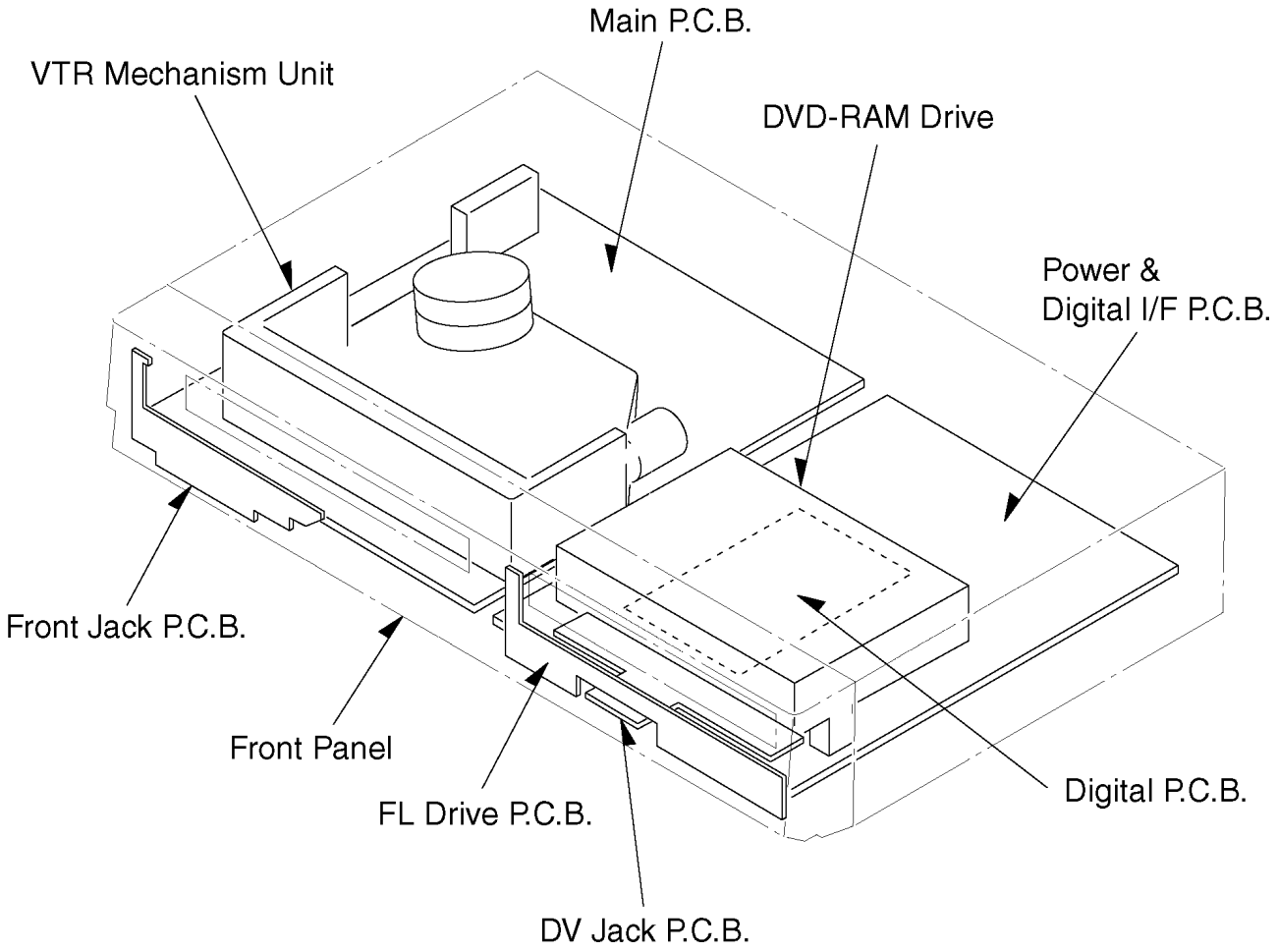
9.1. Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.


9.4. Top Case
9.5. Front Panel
9.7. RAM/Digital P.C.B. Module
9.10. Rear Panel & Fan Motor
9.8. DV Jack P.C.B.
9.11. Power & Digital I/F P.C.B.
9.9. VTR Mechanism Unit
9.6. Front Jack P.C.B. & FL Drive P.C.B.
9.12. Main P.C.B.

9.2. P.C.B. Positions



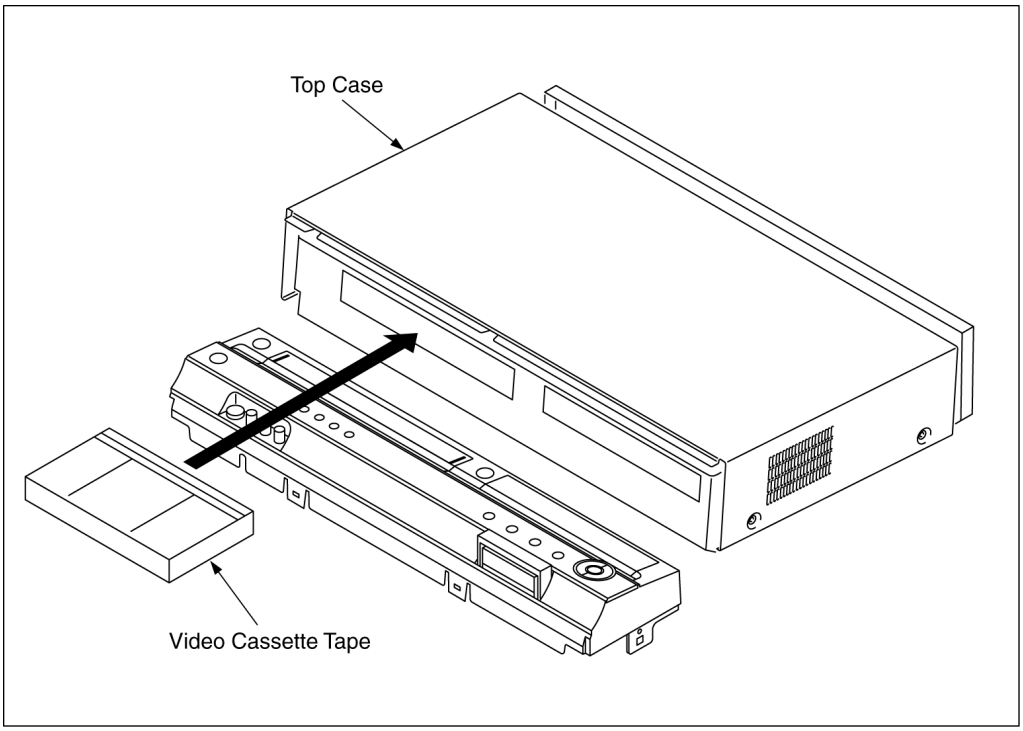
9.3. Caution with inserting cassette tape when disassembling the unit

Note1:

For description of the disassembling procedure, see the section 9.4.

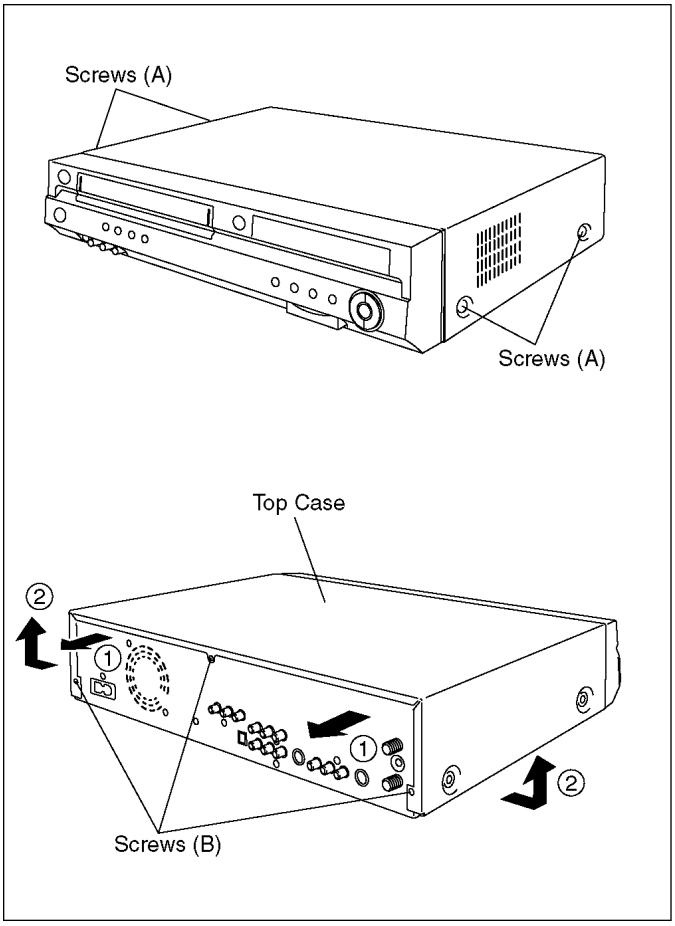
Note2:

Video Cassette might not enter when a strong lighting is applied to VHS Mechanism when Video Cassette is inserted. Please weaken the lighting or cover with the top panel etc.



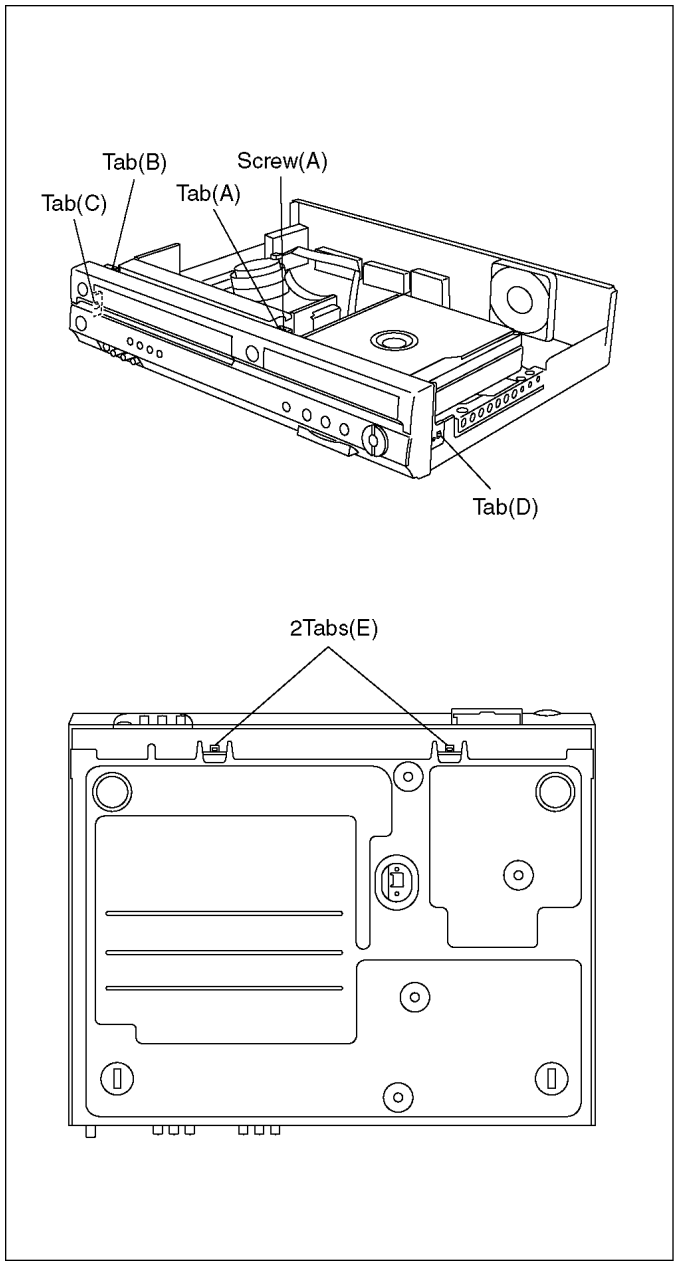
9.4. Top Case

1. Remove the 4 Screws (A) and 3 Screws (B).
2. Slide Top Case rearward and open the both ends at rear side of the Top Case a little and lift the Top Case in the direction of the arrows.



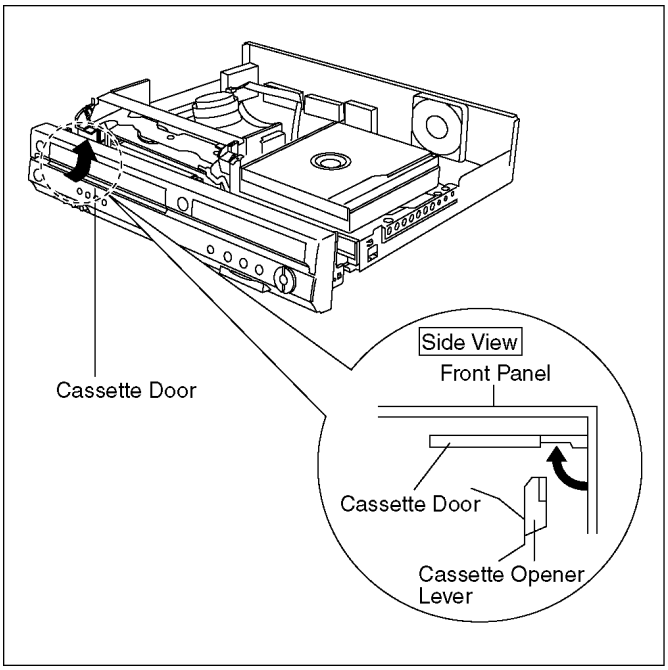
9.5. Front Panel

1. Remove one screw (A).
2. Unlock tab (A) and tab (B) simultaneously.
3. Unlock tab (C) and tab (D) simultaneously.
4. Unlock 2 tabs (E) respectively, and pull out Front Panel with connector slightly.



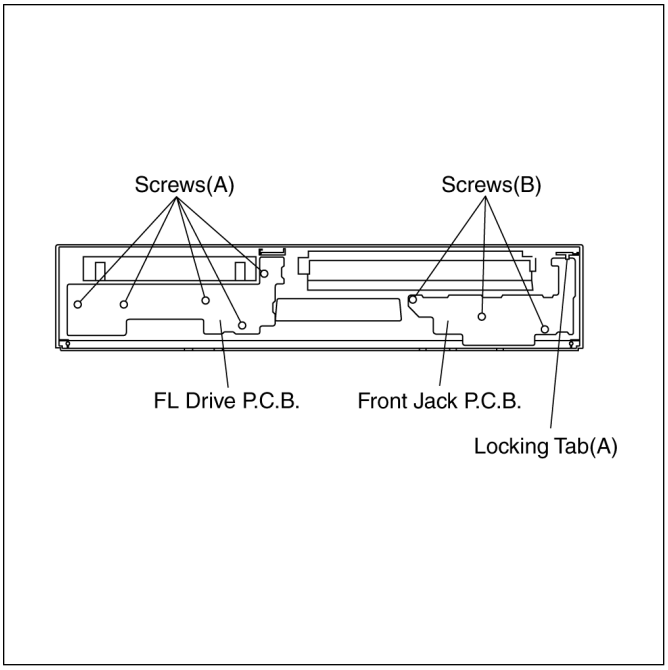
Note:

When attaching Front Panel, in order to hook Cassette Door Opener Lever to Cassette Door, push up cassette door in the direction of arrow and insert a front panel.



9.6. Front Jack P.C.B. & FL Drive P.C.B.

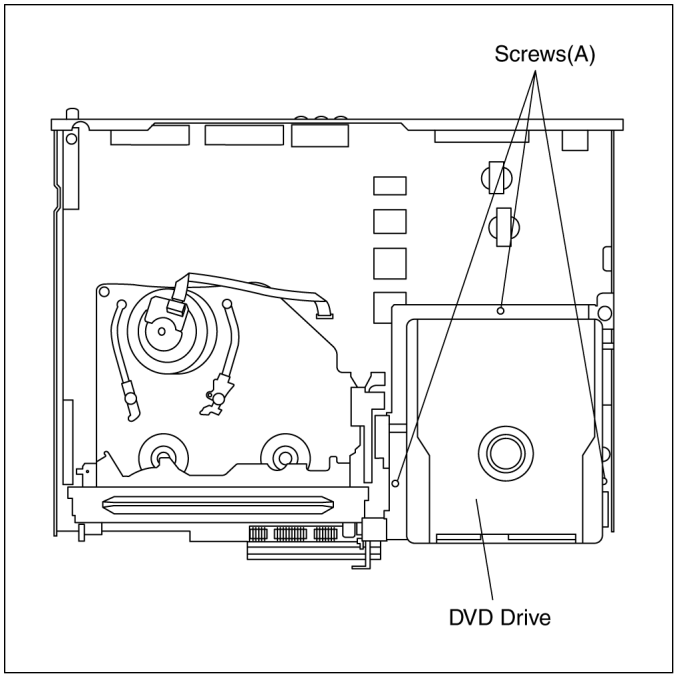
1. Remove 5 screws (A) to remove FL Drive P.C.B.
2. Remove 3 screws (B) and unlock Locking Tab (A) to remove Front Jack P.C.B.



9.7. RAM / Digital P.C.B. Module

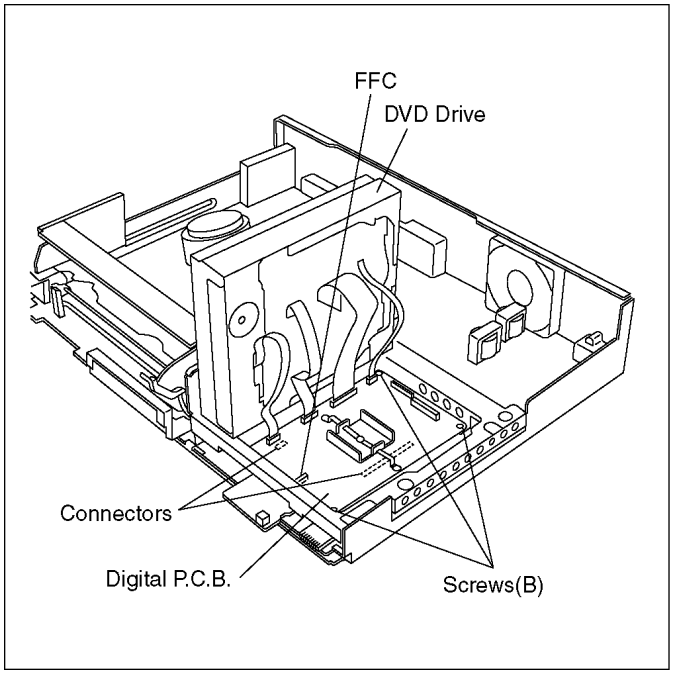
Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

1. Remove 3 Screws (A).

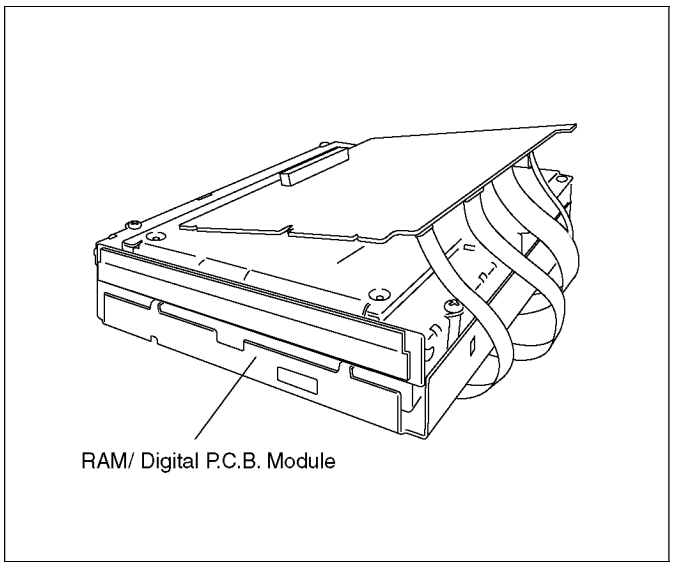


2. With holding DVD drive as below illustration, remove 3 Screws (B) and disconnect FFC.

   And lift up Digital P.C.B. slightly so to disconnect connectors to remove Digital P.C.B..



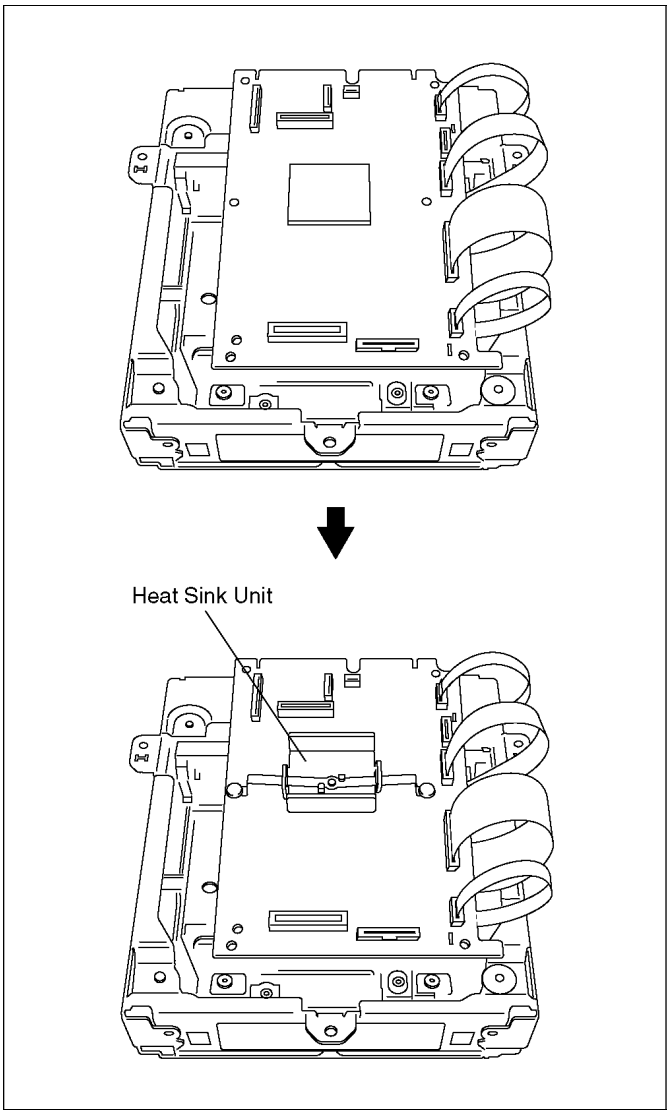
3. Put Digital P.C.B. on RAM Drive and remove RAM/Digital P.C.B. Module.



Note:

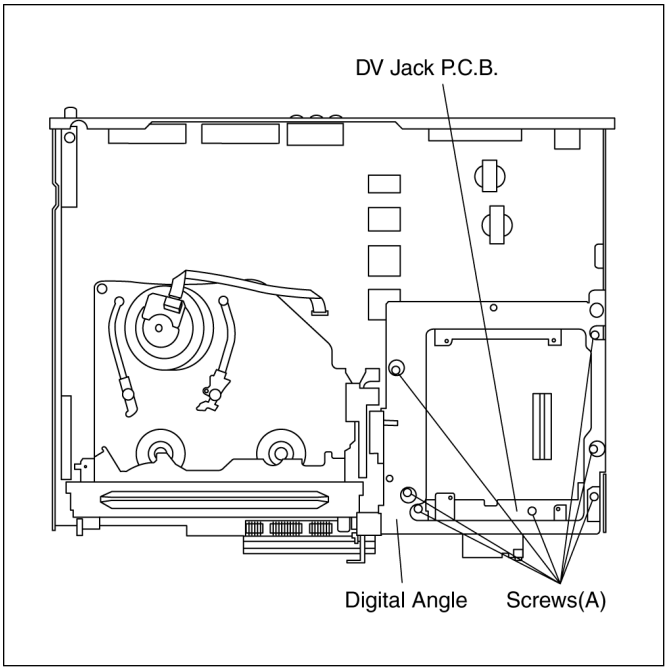
RAM/Digital P.C.B. Module as service part has no heat sink unit.

Before returning to customer, heat sink unit should be installed on Digital P.C.B..



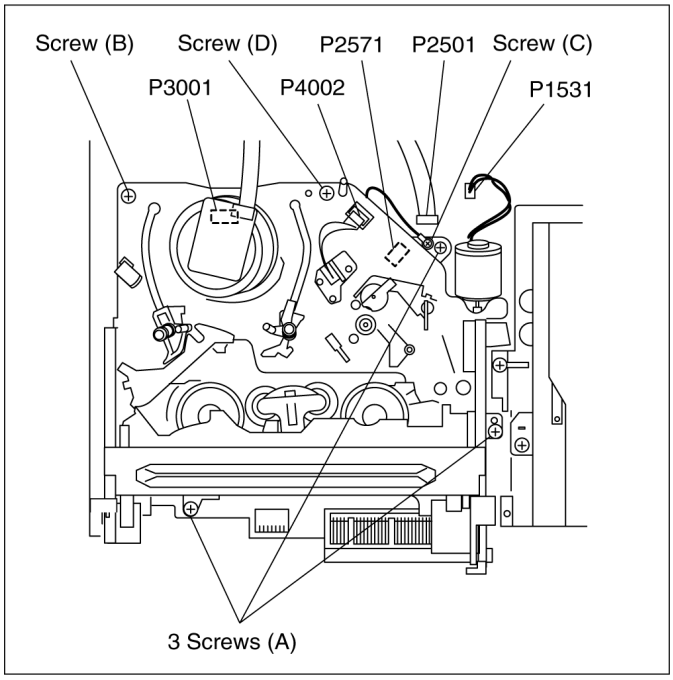
9.8. DV Jack P.C.B.

1. Remove 7 Screws (A).
2. Remove DV Jack P.C.B. with Digital Angle.



9.9. VTR Mechanism Unit

1. Disconnect 3 Connectors (P1531, P2501 and P4002).
2. Remove 3 Black Screws (A), Screw (B) , Screw (C) and Screw (D).
3. Lift up VTR Mechanism Unit perpendicularly so to disconnect Connectors (P2571 and P3001).

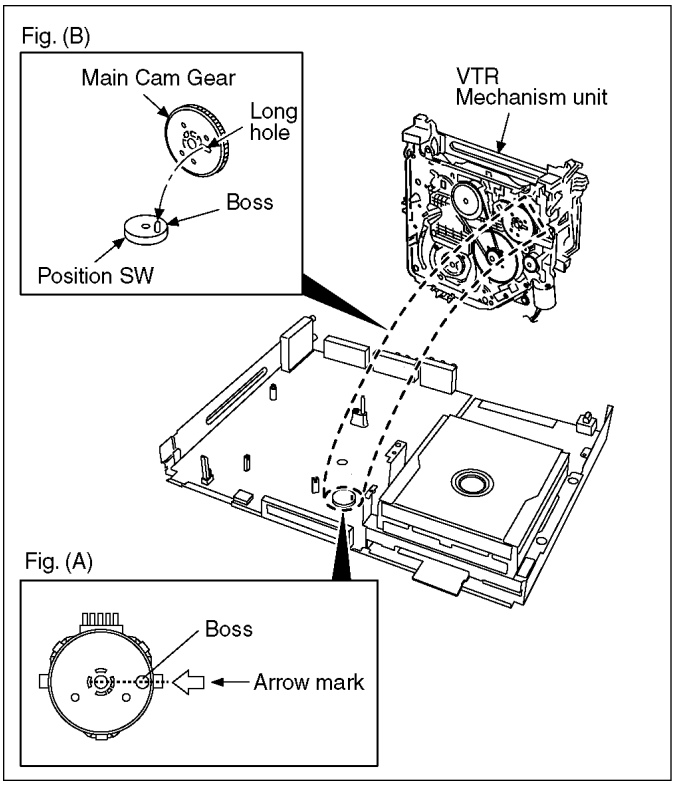


Note:

Pay attention to stiff connections of P2571 and P3001, when removing VTR Mechanism Unit.

9.9.1. Caution for attaching VTR Mechanism Unit

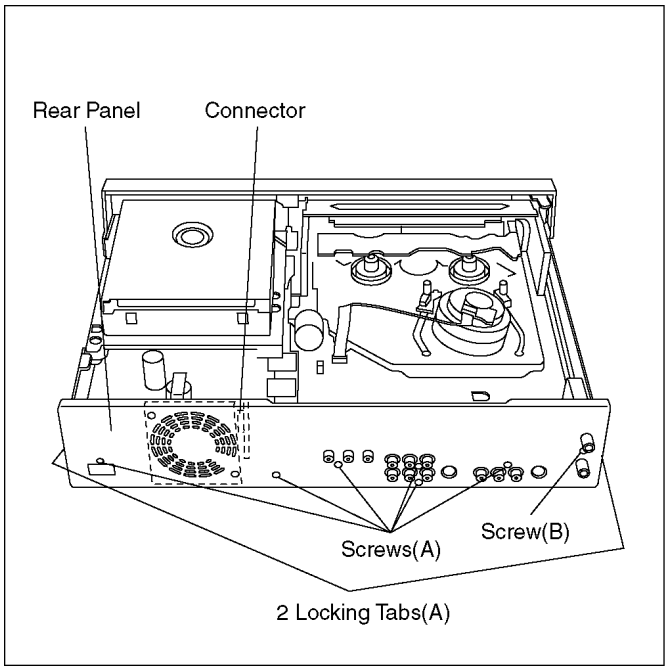
1. Attach VTR Mechanism Unit so that Boss of Position SW is put into long hole of Main Cam Gear, refer to Fig. (B).



9.10. Rear Panel & Fan Motor

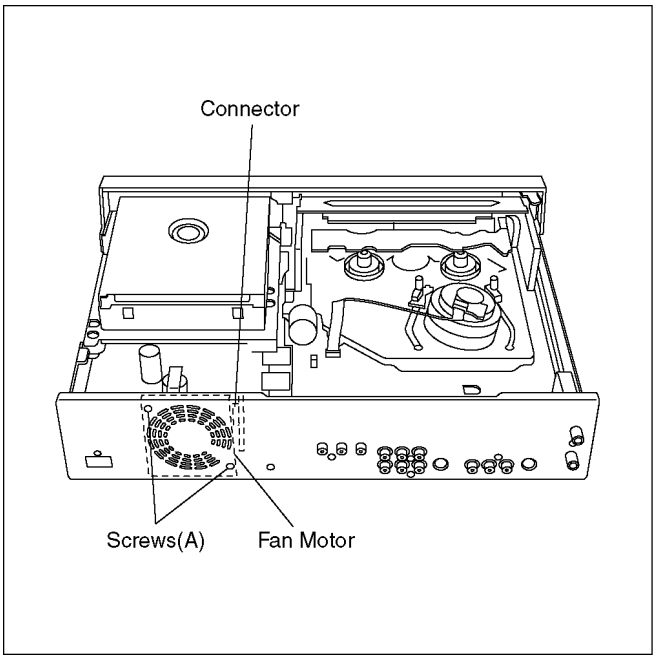
9.10.1. Rear Panel with Fan Motor

1. Disconnect Fan Connector.
2. Remove 6 Screws (A) and 1 Screw (B).
3. Unlock 2 Locking Tabs (A) to remove Rear Panel with Fan Motor.



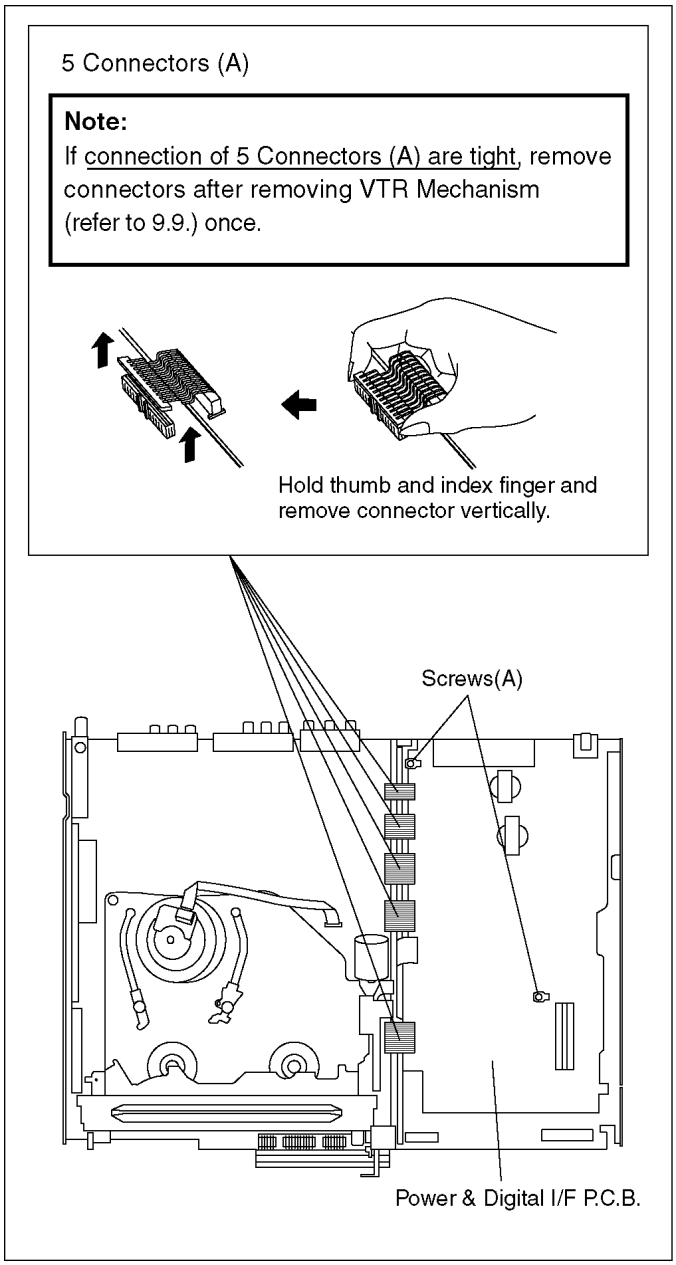
9.10.1.1. Only Fan Motor

1. Disconnect Fan Connector.
2. Remove 2 Screws (A) to Remove Fan Motor.



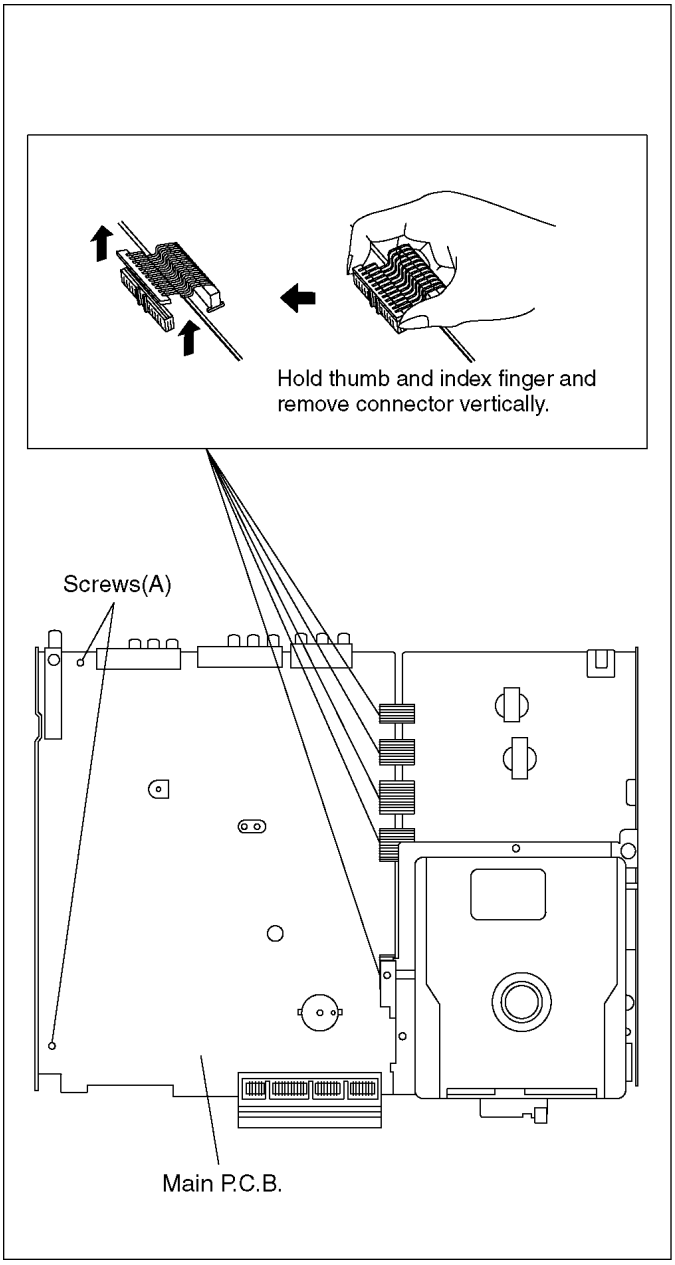
9.11. Power & Digital I/F P.C.B.

1. Disconnect 5 Connectors (A).
2. Remove the 2 Screws (A).
3. Remove Power & Digital I/F P.C.B.


5 Connectors (A)
Note:
If connection of 5 Connectors (A) are tight, remove connectors after removing VTR Mechanism (refer to 9.9.) once.
Hold thumb and index finger and remove connector vertically.
Screws(A)
Power & Digital I/F P.C.B.

9.12. Main P.C.B.

1. Disconnect 5 Connectors.
2. Remove 2 Screws (A) and remove Main P.C.B.



10 Measurements and Adjustments

10.1. Service Positions

Note:

For description of the disassembling procedure, see the section 9.

10.1.1. Checking and Repairing of Power & Digital I/F P.C.B.

1. Top Case
- Remove 4 Screws (A) on side
- Remove 3 Screws (B) on rear
- Remove Top Case

2. Front Panel
- Remove 1 Screw (A) on center
- Unlock 4 Locking Tabs (A),(B),(C),(D)
- Unlock 2 Locking Tabs (E) on bottom to remove Front Panel

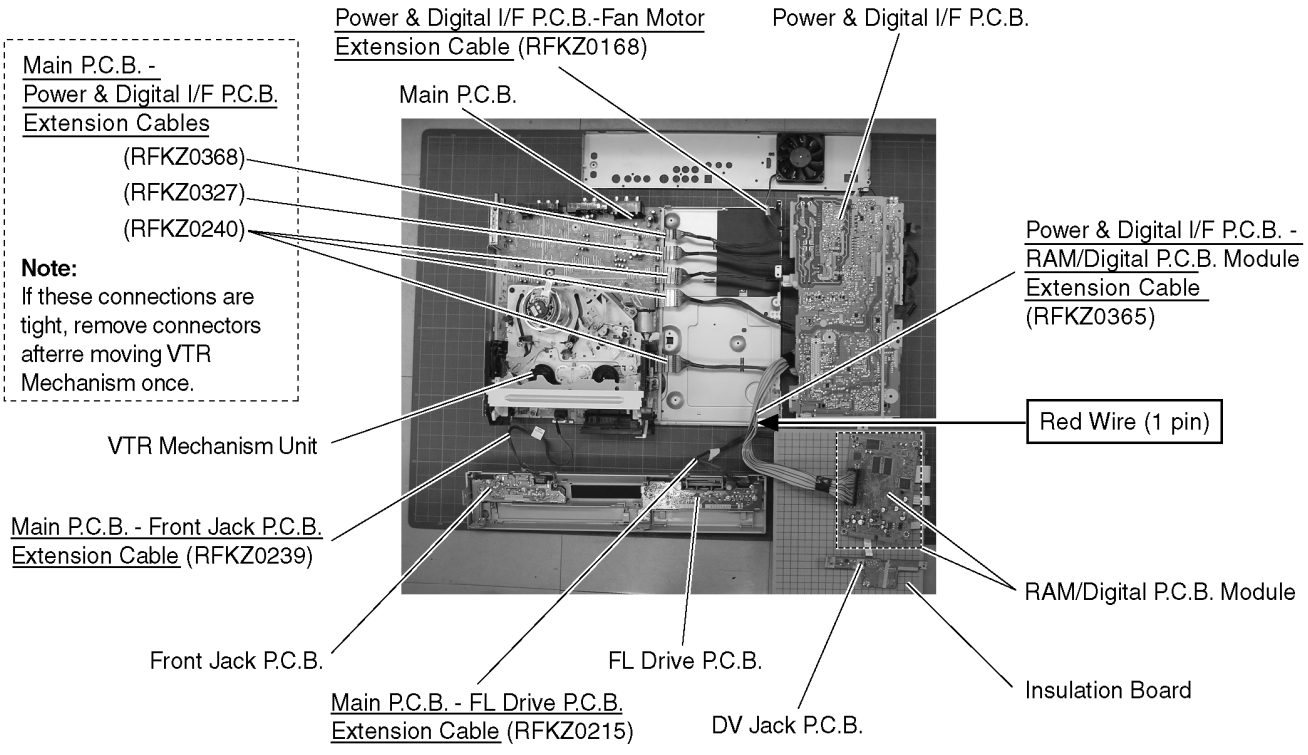
3. Rear Panel with Fan Motor
- Disconnect Fan Connector
- Remove 6 Screws (A) and 1 Screw (B) fixing Rear Panel
- Unlock 2 Locking Tabs to remove Rear Panel with Fan Motor

4. RAM/Digital P.C.B. Module
- Remove 3 Screws (A) fixing DVD Drive and lift up DVD Drive slightly
- With holding DVD drive, remove 3 Screws (B) fixing Digital P.C.B. and disconnect 2 FFCs
- Left up Digital P.C.B.slightly so to disconnect connectors between Digital P.C.B. and Power & Digital I/F P.C.B.
- Remove RAM/Digital P.C.B. Module and put it beside chassis

5. DV Jack P.C.B. with Digital Angle
- Remove 7 Screws (A) fixing Digital P.C.B.
- Remove DV Jack P.C.B. with Digital Angle

6. Power & Digital I/F P.C.B.
- Remove 5 Connectors (A) between Main P.C.B. and Power & Digital I/F P.C.B.
- Remove 2 Screws (A) from Power & Digital I/F P.C.B.
- Remove Power & Digital I/F P.C.B.
- Put an insulated sheet on DVD Drive, and the foil side the Power & Digital I/F P.C.B. faces up
- Connect Extension Cables,
  *betweenMain P.C.B. and Power & Digital I/F P.C.B. with (RFKZ0327/ RFKZ0240 x 3/ RFKZ0368),
  *between Main P.C.B. and Front Jack P.C.B. with (RFKZ0239),
  *between Main P.C.B. and FL Drive P.C.B. with (RFKZ0215),
  *between Power & Digital I/F P.C.B. and Fan Motor with (RFKZ0168),
  *between RAM/Digital P.C.B.Module and Power & Digital I/F P.C.B. with(RFKZ0365).
  Connect an original cable between RAM/Digital P.C.B. Module and DV Jack P.C.B.

Caution :
Red wire in the extension cable should be connected to (1) pin.


Power & Digital I/F P.C.B.-Fan Motor Extension Cable (RFKZ0168)
Power & Digital I/F P.C.B.
Main P.C.B.
Main P.C.B. - Power & Digital I/F P.C.B. Extension Cables
(RFKZ0368)
(RFKZ0327)
(RFKZ0240)
Note:
If these connections are tight, remove connectors afterre moving VTR Mechanism once.
Power & Digital I/F P.C.B. - RAM/Digital P.C.B. Module Extension Cable (RFKZ0365)
Red Wire (1 pin)
VTR Mechanism Unit
Main P.C.B. - Front Jack P.C.B. Extension Cable (RFKZ0239)
RAM/Digital P.C.B. Module
Front Jack P.C.B.
FL Drive P.C.B.
Insulation Board
Main P.C.B. - FL Drive P.C.B. Extension Cable (RFKZ0215)
DV Jack P.C.B.

10.1.2. Checking and Repairing of Main P.C.B.

1. Top Case
- Remove 4 Screws (A) on side.
- Remove 3 Screws (B) on rear.
- Remove Top Case.

2. Front Panel
- Remove one Screw (A) on center.
- Unlock 4 Locking Tabs (A),(B),(C),(D)
- Unlock 2 Locking Tabs (E) on bottom
- Remove Front Panel

3. Rear Panel with Fan Motor
- Disconnect Fan Connector
- Remove 6 Screws (A) and 1 Screw (B) fixing Rear Panel
- Unlock 2 Locking Tabs to remove Rear Panel with Fan Motor

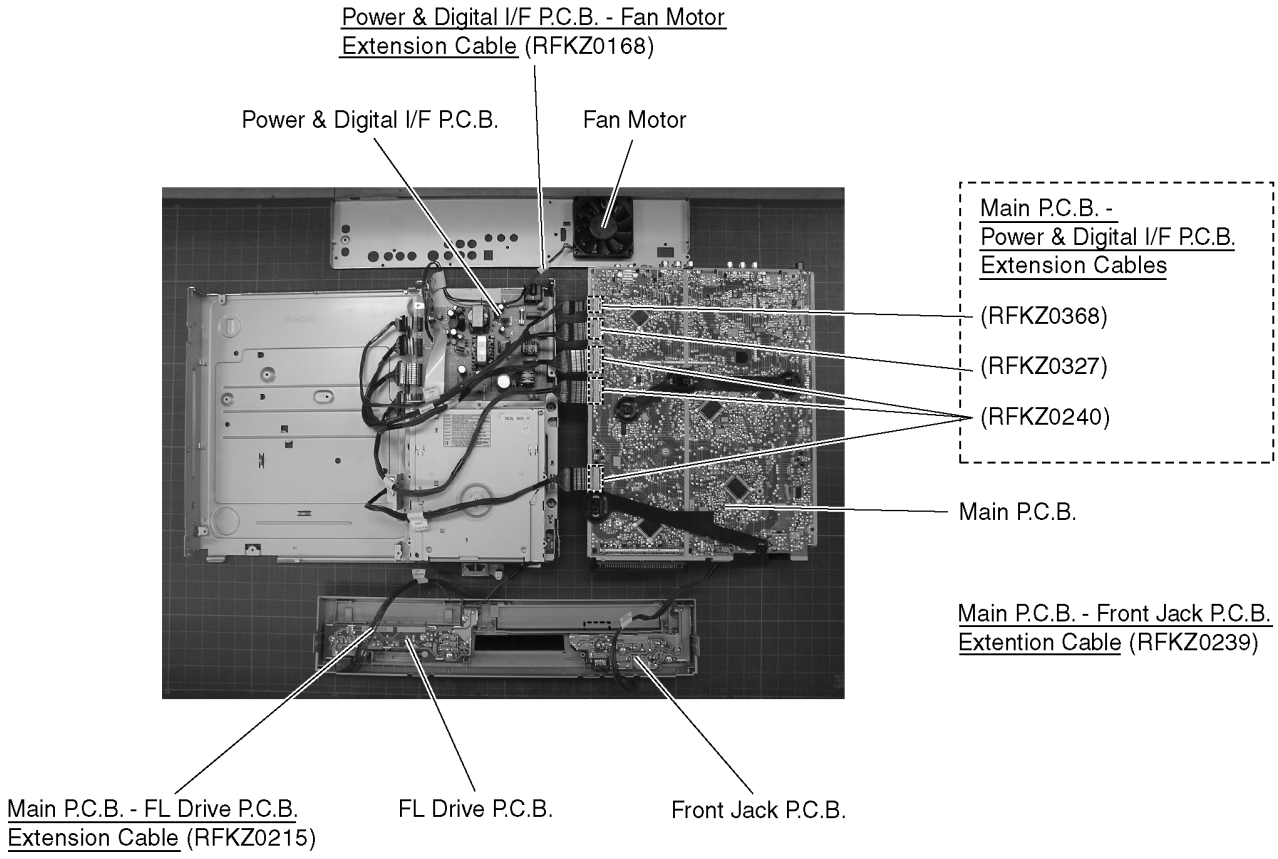
4. VTR Mechanism Unit
- Disconnect 3 Connectors
- Remove 3 Screws (A), Screw (B), Screw (C), Screw (D)
- Lift up VTR Mech. Unit to remove it

5. Main P.C.B.
- Disconnect 5 Connectors (A) between Main P.C.B. and Power & Digital I/F P.C.B.
- Remove 2 Screws (A) fixing Main P.C.B. to remove Main P.C.B.
- Attach VTR Mechanism Unit on to Main P.C.B.
- Tighten Screw (C) with Earth Wire
- Tighten Screw (D) beside Screw (C)
- Insert 1 Connector and 2 FFCs

Hold Main P.C.B.with VTR Mechanism, make it upside-down, and put it.

Connect Extension Cables,
*between Main P.C.B. and Power & Digital I/F P.C.B. with (RFKZ0327/ RFKZ0240 x 3/ RFKZ0368),
*between Main P.C.B. and Front Jack P.C.B. with (RFKZ0239),
*between Main P.C.B. and FL Drive P.C.B. with (RFKZ0215).
*between Power & Digital I/F P.C.B. and Fan Motor with (RFKZ0168).

Caution : Red wire in the extension cable should be connected to (1) pin.


Power & Digital I/F P.C.B. - Fan Motor Extension Cable (RFKZ0168)
Power & Digital I/F P.C.B.
Fan Motor
Main P.C.B. - Power & Digital I/F P.C.B. Extension Cables
(RFKZ0368)
(RFKZ0327)
(RFKZ0240)
Main P.C.B.
Main P.C.B. - Front Jack P.C.B. Extention Cable (RFKZ0239)
Main P.C.B. - FL Drive P.C.B. Extension Cable (RFKZ0215)
FL Drive P.C.B.
Front Jack P.C.B.

10.1.3. Checking and Repairing of RAM / Digital P.C.B. Module

1. Top Case

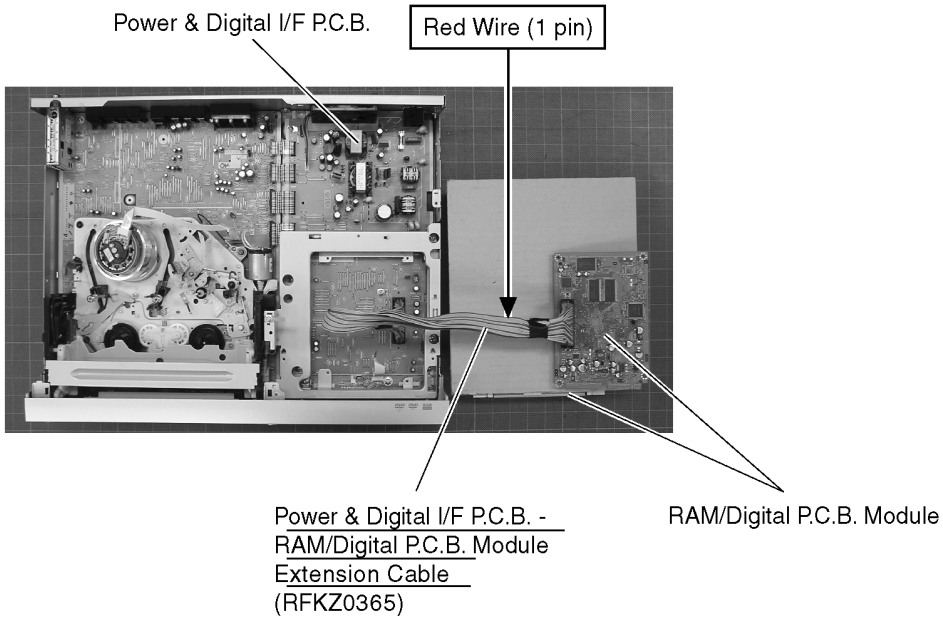
- Remove 4 Screws (A) on side
- Remove 3 Screws (B) on rear
- Remove Top Case

2. RAM/Digital P.C.B. Module

- Remove 3 Screws (A) fixing DVD Drive and lift up DVD Drive slightly
- With holding DVD drive, remove 3 Screws (B) fixing Digital P.C.B. and disconnect FFC
- Left up Digital P.C.B.slightly so to disconnect connectors between Digital P.C.B. and Power & Digital I/F P.C.B.
- Remove RAM/Digital P.C.B. Module and put it beside chassis

Connect Extension Cables,
*between RAM/Digital P.C.B. Module and Power & Digital I/F P.C.B. with (RFKZ0365),

Caution : Red wire in the extension cable should be connected to (1) pin.



10.2. Caution for Replacing Parts

10.2.1. Notice for replacing parts of VHS Mechanism

10.2.1.1. Regarding change of parts of VHS mechanism

The following parts are not compatible with past R4 Mechanism. Use parts of exclusive use.

Ref. No.	Part Name	Part Number		Pcs	
		Current	Previous		
101	RDD CYLINDER ASS'Y	VEG1697KIT	VEG1641KIT	1	*1
101-1	FPC HOLDER	VMD5464	VMD4983	1	
102	CAPSTAN MOTOR	VEM0800T	VEM0750T	1	
105	INTERMEDIATE GEAR	VDG1686	VDG1510	1	
106	MAIN CAM GEAR	VDG1685	VDG1511	1	
114	OPENER PIECE	VMD5466	VMD4252	1	
116	MAIN LEVER	VML3934	VML3624	1	
117	PINCH CHARGE ARM	VML3933	VML3626	1	
122	AC HEAD ASS'Y	L1AE00000044	L1AE00000036	1	
130	T BRAKE ARM	VXL3343	VXL3113	1	
135	SIDE PLATE L	VMD5468	VMD4255	1	
136	SIDE PLATE R	VMD5469	VMD4254	1	
137	CASSETTE HOLDER UNIT	VXA8265	VXA7110	1	
139	SECTOR GEAR	VXA8323	VXA7311	1	

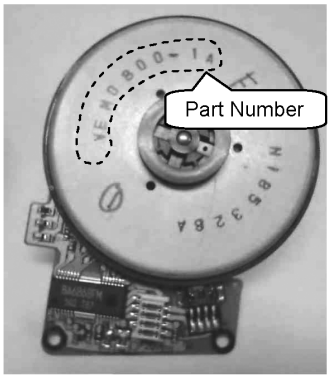
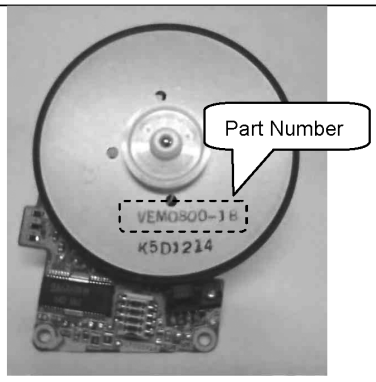
*1: Part Number of RDD CYLINDER ASS'Y is different depending on the model.

Capstan Motor (VEM0800T) used for current R4 Mechanism is not compatible with Capstan Motor (VEM0750T) of previous R4 Mechanism.

Therefore, confirm part number by Service Manual of individual models and use part of exclusive use.

10.2.2. Notice for Replacing Capstan Motor

[VEM0800-1A] is printed on capstan motor of replacement part.
[VEM0800-1B] is printed on capstan motor of product.
Though printed part numbers differ between product and replacement part, **[VEM0800-1A] and [VEM800-1B] have compatibility.**

Replacement Part **"VEM0800-1A"** or **"VEM0800-1B"**	Product **"VEM0800-1B"**
Bottom 	Bottom 
Top	Top

10.2.3. Items that should be done after replacing parts

√: Necessary —: Unnecessary

	Reset IC6001 **(*Note1)**	Initialize IC7501 **(*Note1)**	PG Shifter Automatic Adjustment **(*Note2)**	X-VALUE & LINEARITY (P2 and P3 Posts) Adjustment **(*Note3)**
DD Cylinder	—	—	√	√
Main P.C.B.	√	√	—	—
IC6001	√	—	—	—
IC7501	—	√	—	—
Power & Digital I/F P.C.B.	—	—	√	—
IC37501 (EEPROM)	—	—	√	—

***Note1:**

Resetting or initializing Method

Resetting or initializing object	Condition of power	Short Terminal
IC6001	POWER ON	TL6004 (RESET_L) and TL6002 (GND)
IC7501	AC OFF	TW7501 (VDD_5V) and GND

***Note2:**

PG Shifter Automatic Adjustment Procedure

PROCEDURE			F.I.P. DISPLAY
Turn on the Service Mode. 1. Set Drive Select to VHS and press the [STOP] and [EJECT] key simultaneously for more than 3 seconds.			00000
Activate the Service Mode 2. (Auto tracking will be turned off) 2. Press the [STOP] and [EJECT] key simultaneously twice.			20000
Put it in PG adjustment mode. 3. Press the EJECT key for more than 3 seconds.			2 00
Set it adjustment No.1. 4. Press the CH UP key once.			2 100
Insert the alignment cassette tape (VFM8080HQFP). 5. The PG Shifter Adjustment starts automatically.			2 100
Result	Success	Cassette tape is ejected automatically.	2 100
	Error	NG1 in the PG Shifter Automatic Adjustment (The cylinder rotation is unstable during the automatic adjustment.)	F20
		NG2 in the PG Shifter Automatic Adjustment (The vertical sync signal is lacked while over 5 seconds on the alignment tape.)	F21
		NG3 in the PG Shifter Automatic Adjustment (The installing position of Heads to the cylinder is out of specification.	F22
		NG4 in the PG Shifter Automatic Adjustment (The servo is not locked to the cylinder for more than 10 sec.)	F23
Exit from Service Mode. 6. Press [STOP] and [EJECT] keys simultaneously in 6 times. * Then the FIP becomes normal indication.			10:00 (Normal Indication)

***Note3:**

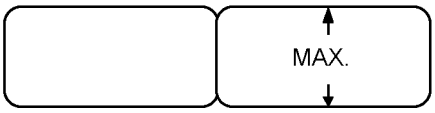
X-VALUE & LINEARITY (P2 and P3 Posts) Adjustment Procedure

1. Set the Auto Tracking to off.
   (1) Set Drive Select to VHS and press the [STOP] and [EJECT] keys simultaneously for more than 3 seconds to enter Service Mode.
   (2) Press [FF] and [EJECT] keys simultaneously twice to activate Service Mode 2, and then Auto-Tracking is turned off.
2. Perform the X-VALUE ADJUSTMENT

X-VALUE ADJUSTMENT

1. After turning off the Auto tracking, playback the alignment Tape and press [CH UP] and [CH DOWN] keys simultaneously to adjust the tracking to FIX value.
2. Adjust A/C Head Base so that the envelope becomes maximum level. (It is described on "**5-2. Tape Interchangeability Adjustment**" in "**R4 Mechanism**" that is separated volume.)

Alignment Tape	VFM8080HQFP
Test Point of Playback Envelope	TW3001 (or TW4502)

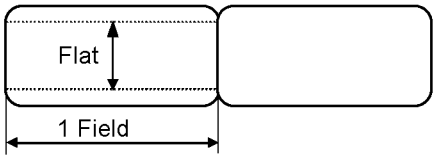


Playback Envelope

LINEARITY ADJUSTMENT

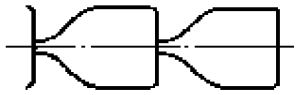
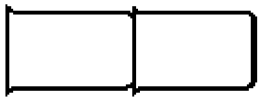
1. After turning off the Auto tracking, playback the alignment Tape and press [CH UP] and [CH DOWN] keys simultaneously to adjust the tracking to FIX value.
2. Adjust the LINEARITY so that the envelope is flat when moving tracking to (+) and (-) directions.

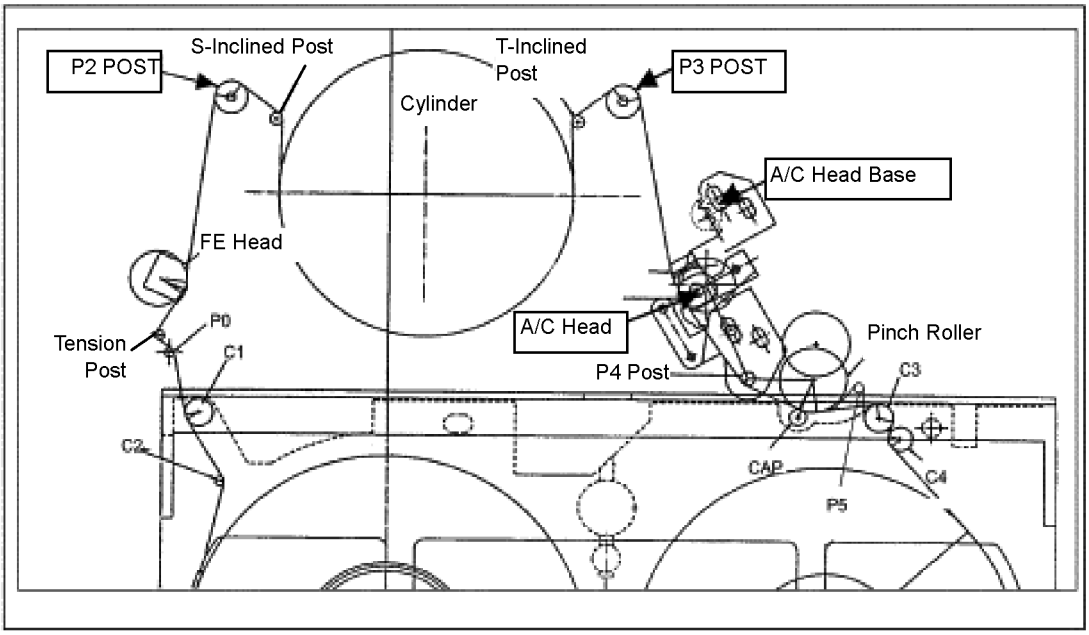
Alignment Tape	VFM8080HQFP
Test Point of Playback Envelope	TW3001 (or TW4502)



Playback Envelope

- Main symptoms and Adjustment point

Envelope	Post Name		Adjustment Method
	P2 Post		Turn P2 Post counter-clockwise (Approx. 1/2 revolution)
	P2 Post		Turn P2 Post clockwise (Approx. 1/4 revolution)
	P3 Post		Turn P3 Post clockwise (Approx. 1/2 revolution)
	P3 Post		Turn P3 Post counter-clockwise (Approx. 1/4 revolution)
	P2 Post	P3 Post	Turn P2 Post clockwise (Less than 1 revolution) Turn P3 Post counter-clockwise (Less than 1revolution)



10.3. Standard Inspection Specifications after Making Repairs

After making repairs, we recommend performing the following inspection, to check normal operation.

No.	Procedure	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.
2	Insert RAM disc.	The Panasonic RAM disc should be recognized.
3	Enter the EE (TU IN / AV IN - AV OUT) mode.	No abnormality should be seen in the picture, sound or operation.
4	Perform auto recording and playback for one minute using the RAM disc.	No abnormality should be seen in the picture, sound or operation. *Panasonic DVD-RAM disc should be used when recording and playback.
5	If a problem is caused by a VCD, DVD-R, DVD-Video, Audio-CD, or MP3, playback the test disc.	No abnormality should be seen in the picture, sound or operation.
6	Models with DV Input Jack: In case of that the trouble is caused by DV terminal.	Models with DV Input Jack; 1) DV terminal: Check to be able to record from DVC.
7	After checking and making repairs, upgrade the firmware to the latest version.	Make sure that [FIRM_SUCCESS] appears in the FL displays. *[UNSUPPORT] display means the unit is already updated to newest same version. Then version up is not necessary.
8	Transfer [9][9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).	Make sure that [CLR] appears in the FL display. After checking it, turn the power off.

Use the following checklist to establish the judgement criteria for the picture and sound.

Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering color				
	Color fading				

11 Miscellaneous

11.1. Abbreviations

11.1.1. DVD

INITIAL/LOGO		ABBREVIATIONS
A	A0~UP	ADDRESS
	ACLK	AUDIO CLOCK
	AD0~UP	ADDRESS BUS
	ADATA	AUDIO PES PACKET DATA
	ALE	ADDRESS LATCH ENABLE
	AMUTE	AUDIO MUTE
	AREQ	AUDIO PES PACKET REQUEST
	ARF	AUDIO RF
	ASI	SERVO AMP INVERTED INPUT
	ASO	SERVO AMP OUTPUT
	ASYNC	AUDIO WORD DISTINCTION SYNC
B	BCK	BIT CLOCK (PCM)
	BCKIN	BIT CLOCK INPUT
	BDO	BLACK DROP OUT
	BLKCK	SUB CODE BLOCK CLOCK
	BOTTOM	CAP. FOR BOTTOM HOLD
	BYP	BYPATH
	BYTCK	BYTE CLOCK
C	CAV	CONSTANT ANGULAR VELOCITY
	CBDO	CAP. BLACK DROP OUT
	CD	COMPACT DISC
	CDSCK	CD SERIAL DATA CLOCK
	CDSRDATA	CD SERIAL DATA
	CDRF	CD RF (EFM) SIGNAL
	CDV	COMPACT DISC-VIDEO
	CHNDATA	CHANNEL DATA
	CKSL	SYSTEM CLOCK SELECT
	CLV	CONSTANT LINEAR VELOCITY
	COFTR	CAP. OFF TRACK
	CPA	CPU ADDRESS
	CPCS	CPU CHIP SELECT
	CPDT	CPU DATA
	CPUADR	CPU ADDRESS LATCH
	CPUADT	CPU ADDRESS DATA BUS
	CPUIRQ	CPU INTERRUPT REQUEST
	CPRD	CPU READ ENABLE
	CPWR	CPU WRITE ENABLE
	CS	CHIP SELECT
	CSYNCIN	COMPOSITE SYNC IN
	CSYNCOUT	COMPOSITE SYNC OUT
D	DACCK	D/A CONVERTER CLOCK
	DEEMP	DEEMPHASIS BIT ON/OFF
	DEMPH	DEEMPHASIS SWITCHING
	DIG0~UP	FL DIGIT OUTPUT
	DIN	DATA INPUT
	DMSRCK	DM SERIAL DATA READ CLOCK
	DMUTE	DIGITAL MUTE CONTROL
	DO	DROP OUT
	DOUT0~UP	DATA OUTPUT
	DRF	DATA SLICE RF (BIAS)
	DRPOUT	DROP OUT SIGNAL
	DREQ	DATA REQUEST
	DRESP	DATA RESPONSE
	DSC	DIGITAL SERVO CONTROLLER
	DSLF	DATA SLICE LOOP FILTER
	DVD	DIGITAL VIDEO DISC

INITIAL/LOGO		ABBREVIATIONS
E	EC	ERROR TORQUE CONTROL
	ECR	ERROR TORQUE CONTROL REFERENCE
	ENCSEL	ENCODER SELECT
	ETMCLK	EXTERNAL M CLOCK (81MHz/40.5MHz)
	ETSCLK	EXTERNAL S CLOCK (54MHz)
F	FBAL	FOCUS BALANCE
	FCLK	FRAME CLOCK
	FE	FOCUS ERROR
	FFI	FOCUS ERROR AMP INVERTED INPUT
	FEO	FOCUS ERROR AMP OUTPUT
	FG	FREQUENCY GENERATOR
	FSC	FREQUENCY SUB CARRIER
	FSCK	FS (384 OVER SAMPLING) CLOCK
G	GND	COMMON GROUNDING (EARTH)
H	HA0~UP	HOST ADDRESS
	HD0~UP	HOST DATA
	HINT	HOST INTERRUPT
	HRXW	HOST READ/WRITE
I	IECOUT	IEC958 FORMAT DATA OUTPUT
	IPFRAG	INTERPOLATION FLAG
	IREF	I (CURRENT) REFERENCE
	ISEL	INTERFACE MODE SELECT
L	LDON	LASER DIODE CONTROL
	LPC	LASER POWER CONTROL
	LRCK	L CH/R CH DISTINCTION CLOCK
M	MA0~UP	MEMORY ADDRESS
	MCK	MEMORY CLOCK
	MCKI	MEMORY CLOCK INPUT
	MCLK	MEMORY SERIAL COMMAND CLOCK
	MDATA	MEMORY SERIAL COMMAND DATA
	MDQ0~UP	MEMORY DATA INPUT/OUTPUT
	MDQM	MEMORY DATA I/O MASK
	MLD	MEMORY SERIAL COMMAND LOAD
	MPEG	MOVING PICTURE EXPERTS GROUP
O	ODC	OPTICAL DISC CONTROLLER
	OFTR	OFF TRACKING
	OSCI	OSCILLATOR INPUT
	OSCO	OSCILLATOR OUTPUT
	OSD	ON SCREEN DISPLAY
P	P1~UP	PORT
	PCD	CD TRACKING PHASE DIFFERENCE
	PCK	PLL CLOCK
	PDVD	DVD TRACKING PHASE DIFFERENCE
	PEAK	CAP. FOR PEAK HOLD
	PLLCLK	CHANNEL PLL CLOCK
	PLLOK	PLL LOCK
	PWMCTL	PWM OUTPUT CONTROL
	PWMDA	PULSE WAVE MOTOR DRIVE A
	PWMOA, B	PULSE WAVE MOTOR OUT A, B

INITIAL/LOGO		ABBREVIATIONS
R	RE	READ ENABLE
	RFENV	RF ENVELOPE
	RFO	RF PHASE DIFFERENCE OUTPUT
	RS	(CD-ROM) REGISTER SELECT
	RSEL	RF POLARITY SELECT
	RST	RESET
	RSV	RESERVE
S	SBI0, 1	SERIAL DATA INPUT
	SBO0	SERIAL DATA OUTPUT
	SBT0, 1	SERIAL CLOCK
	SCK	SERIAL DATA CLOCK
	SCKR	AUDIO SERIAL CLOCK RECEIVER
	SCL	SERIAL CLOCK
	SCLK	SERIAL CLOCK
	SDA	SERIAL DATA
	SEG0~UP	FL SEGMENT OUTPUT
	SELCLK	SELECT CLOCK
	SEN	SERIAL PORT ENABLE
	SIN1, 2	SERIAL DATA IN
	SOUT1, 2	SERIAL DATA OUT
	SPDI	SERIAL PORT DATA INPUT
	SPDO	SERIAL PORT DATA OUTPUT
	SPEN	SERIAL PORT R/W ENABLE
	SPRCLK	SERIAL PORT READ CLOCK
	SPWCLK	SERIAL PORT WRITE CLOCK
	SQCK	SUB CODE Q CLOCK
	SQCX	SUB CODE Q DATA READ CLOCK
	SRDATA	SERIAL DATA
	SRMADR	SRAM ADDRESS BUS
	SRMDT0~7	SRAM DATA BUS 0~7
	SS	START/STOP
	STAT	STATUS
	STCLK	STREAM DATA CLOCK
	STD0~UP	STREAM DATA
	STENABLE	STREAM DATA INPUT ENABLE
	STSEL	STREAM DATA POLARITY SELECT
	STVALID	STREAM DATA VALIDITY
	SUBC	SUB CODE SERIAL
	SBCK	SUB CODE CLOCK
	SUBQ	SUB CODE Q DATA
	SYSCLK	SYSTEM CLOCK
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VCDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER
X	X	X´ TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X´ TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X´ TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS STROBE
	XVSYNCO	X VERTICAL SYNC OUTPUT

11.1.2. VHS

443NT [L]	4.43 NTSC Ⓛ
A. COMP	AUDIO COMPONENT SIGNAL
A. COMPO	AUDIO COMPONENT SIGNAL
A. D.P [L]	AUDIO DUBBING PAUSE Ⓛ
A. D/L [L]	AUDIO DUBBING PAUSE Ⓛ
A. DEF [S]	AUDIO DEFEAT
A. DEF [S] [L]	AUDIO DEFEAT
A. DUB P [L]	AUDIO DUBBING PAUSE Ⓛ
A. DUB [H]	AUDIO DUBBING Ⓗ
A. ERASE	AUDIO ERASE
A. H. SW	AUDIO HEAD SWITCHING PULSE
A. HEAD [R]	AUDIO HEAD (REC)
A. HEAD [W]	AUDIO HEAD (PLAY)
A. IN [L]	AUDIO INPUT (L)
A. IN [R]	AUDIO INPUT (R)
A. MUT [H]	AUDIO MUTE Ⓗ
A. MUTE [H]	AUDIO MUTE Ⓗ
A. OUT [L]	AUDIO OUTPUT (L)
A. OUT [R]	AUDIO OUTPUT (R)
A. RF OUT	AUDIO RF SIGNAL OUTPUT
A/VS/S. DATA	AV SW/SERIAL DATA
AC ONLINE	AC ONLINE
AC. O/EE. H	AC ONLINE/EE Ⓗ
AFC S C	AFC S CURVE
AFC [S]	AFC S CURVE
AFC. DEF	AFC DEFEAT
ARFC OUT	AUDIO RF SIGNAL OUTPUT
ART. V	ARTIFICIAL VERTICAL SYNC SIGNAL
ART. V. MM	ARTIFICIAL VERTICAL SYNC SIGNAL MONO MULTI
ART. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL Ⓗ/NORMAL
AT. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL
ATSW/TEST/NOR/SE	TEST/NORMAL/SERVICE
AUDIO IN [L]	AUDIO INPUT (L)
AUDIO IN [R]	AUDIO INPUT (R)
AUDIO OUT [L]	AUDIO OUTPUT (L)
AUDIO OUT [R]	AUDIO OUTPUT (R)
AUDIO SELECT [H]	AUDIO SELECT Ⓗ
AUDIO. L	AUDIO (L)
AUDIO. R	AUDIO (R)
AV CNT	AV CONTROL
AV CTL	AV CONTROL
AV CTL/S. CLK	AV CONTROL/SERIAL CLOCK
AV. C.M.	AV CONTROL MODE
AVCNT/METER. R	AV CONTROL/LEVEL METER (R)
AVSW/METER. L	AV SW/LEVEL METER (L)
B MODE. H	B MODE Ⓗ
B.G.P	BURST GATE PULSE
BACKUP 5V	BACK UP 5V
BAND. U.E.	BAND U
BANDVL. D	BAND VL
BI/MI [L]	BILINGUAL/MIX Ⓛ
BIL	BILINGUAL
BIL [L]	BILINGUAL Ⓛ
BIL. [H]	BILINGUAL Ⓗ
BIL/M1 [L]	BILINGUAL Ⓛ
BS CLOCK	BS CLOCK
BS DATA	BS DATA
BS LCH IN	BS L CHANNEL INPUT
BS MIX [H]	BS MIX Ⓗ
BS MON [H]	BS MONITOR Ⓗ
BS MONI [H]	BS MONITOR Ⓗ
BS RCH IN	BS R CHANNEL INPUT
BS VIDEO	BS VIDEO SIGNAL
BS VIDEO/BS1	BS VIDEO SIGNAL
BS [H]	BS Ⓗ
BS. LEVEL	BS LEVEL
BS. M [H]	BS MONITOR Ⓗ
BS/VTR [H]	BS/VTR Ⓗ
BUS CLK	BUS CLOCK
BUS LSN	BUS LISTEN
BUS TLK	BUS TALK
BUZZER	BUZZER
CAP EC	CAPSTAN TORQUE CONTROL
CAP M GND	CAPSTAN MOTOR GND
CAP. ET	CAPSTAN TORQUE CONTROL
CAP. FG1	CAPSTAN FG1 PULSE
CAP. FG2	CAPSTAN FG2 PULSE
CAS. SW	CASSETTE SW
CCN	PLAYBACK CONTROL SIGNAL (–)
CCP	PLAYBACK CONTROL SIGNAL (+)
CHM	CONTROL SIGNAL (+)
CHP	CONTROL SIGNAL (–)
CINEM [L]	CINEMA Ⓛ
CINEMA [L]	CINEMA Ⓛ
CINEMA/MIX	CINEMA/MIX
CKL	RATCH LOCK
CKS	SHIFT LOCK
CL	CLOCK
CLK	CLOCK
CLK (C.G)	CLOCK
CLOCK. IN	CLOCK INPUT
CLP	CLAMP
COL/B/W/NOR	COLOUR/BLACK & WHITE/NORMAL
COLOR [H]	COLOUR Ⓗ
CONV	CONVERTOR
CS	CHIP SELECT
CTL GND	CONTROL GND
CTL HEAD [+]	CONTROL HEAD (+)
CTL HEAD [–]	CONTROL HEAD (–)
CTL [+]	CONTROL HEAD (+)
CTL [–]	CONTROL HEAD (–)
CUE BIAS	CUE BIAS
CURRENT LIM	CURRENT LIMMITER
CYL ET	CYLINDER TORQUE CONTROL

CYL GND	CYLINDER GND	FULL. E. 12V	FULL ERASE 12V
D.F.M. REC [H]	DELAIED FM RECORDING Ⓗ	GND [A]	GND (ANALOG)
D. FM REC [L]	DELAIED FM RECORDING Ⓛ	GND [TU]	GND (TUNER)
D. GND	DIGITAL GND	GND/N. SW. 12V	GND/NON SW 12V
D. REC [H]	DELAYED RECORDING Ⓗ	H. SYNC	HORIZONTAL SYNC
D4/S. LED	D4/STILL LED	H. AMP. SW	HEAD AMP SW PULSE
D4/STILLED	D4/STILL LED	H. P <R>	HEAD PHONE (R)
DAC [CLK]	TUNER DAC (CLOCK)	H. P <L>	HEAD PHONE (L)
DAC/FSCS	TUNER DAC/FS CHIP SELECT	H. P GND	HEAD PHONE GND
DAREC [H]	DELAYED AUDIO RECORDING Ⓗ	H. P OUT [L]	HEAD PHONE OUTPUT (L)
DATA	DATA	H. P OUT [R]	HEAD PHONE OUTPUT (R)
DECODER [L]	DECODER (L)	H. SW	HEAD SW PULSE
DECODER [R]	DECODER (R)	HEAD PHONE [L]	HEAD PHONE (L)
DEW	DEW	HEAD PHONE [R]	HEAD PHONE (R)
DEW SNS	DEW SENSOR	HEAD SW	HEAD SW
DFMRE [H]	DELAYED FM AUDIO RECORDING Ⓗ	HEATER [+]	HEATER (+)
E. REC 5V	EXCEPT RECORDING 5V	HEATER [–]	HEATER (–)
EC	ERROR TORQUE CONTROL	HSS	HORIZONTAL SYNC SIGNAL
ECR	ERROR TORQUE CONTROL REFERENCE VOLTAGE	HTR [+]	HEATER (+)
		HTR [–]	HEATER (–)
EDT TRIG [L]	EDIT TRIGGER Ⓛ	I RFE	REFERENCE CURRENT
EDIT [H]	EDIT Ⓗ	ICL	CONTROL AGC CIRCUIT
EE [H]	EE Ⓗ	IF	INTERMEDIATE FREQUENCY
EE [H]/INS [M]	EE Ⓗ/INSERT Ⓜ	IN SELA1	INPUT SELECT A1 POSITION
EE. VV. TR	EE/VV/TRICK PLAY	IN SELA2	INPUT SELECT A2 POSITION
EJECT. PO	EJECT POSITION	IN SELA3	INPUT SELECT A3 POSITION
EJECT/VDET	EJECT/REVERSE SLOW LOCK	INS L/R [L]	INSERT Lch/Rch Ⓛ
ENV. SEL	ENVELOPE SELECT	INS. [H]	INSERT Ⓗ
ENVE. OUT	ENVELOPE OUTPUT	INSEL A1	INPUT SELECT A1 POSITION
ENVE. SEL	ENVELOPE SELECT	INSEL A2	INPUT SELECT A2 POSITION
ENV SELECT	ENVELOPE SELECT	INSERT	INSERT
EP [H]	LP Ⓗ	INSERT [H]	INSERT Ⓗ
EP/LP [H]	LP Ⓗ	IO CS	INPUT/OUTPUT CHIP SELECT
EP/LP/SP	LP/SP	JOG1	JOG1
EP/SS [H]	LP/SLOW/STILL/STOP Ⓗ	JOG S3 LED/FOWRD	JOG LED/FORWARD LED
EPROMCS	EPROM CHIP SELECT	JOG/F. LED	JOG LED/FORWARD LED
EX. REC 5V	EXCEPT RECORDING 5V	JSB [H]	JSB Ⓗ
FF/REW [L]	FIRST FORWARD/REWIND Ⓛ	JST. CLCK	JUST CLOCK
FG1 IN	FG1 PULSE INPUT	JST. CLK	JUST CLOCK
FG2 IN	FG2 PULSE INPUT	JST. CLOCK	JUST CLOCK
FILTER ADJUSTMENT	FILTER ADJUSTMENT	L. OUT	Lch OUTPUT
FLY ERASE [H]	FLYING ERASE HEAD ON Ⓗ	L. CH [H]	Lch Ⓗ
FLY ON [H]	FLYING ERASE HEAD ON Ⓗ	L. CH [L]	Lch Ⓛ
FLY. E [H]	FLYING ERASE HEAD ON Ⓗ	LED (MAIN)	LED (MAIN)
FM MUT [H]	FM AUDIO MUTE Ⓗ	LED (STEREO)	LED (STEREO)
FM MUTE [H]	FM AUDIO MUTE Ⓗ	LED (SUB)	LED (SUB)
FM OUT [L]	FM OUTPUT (L)	LED CKL	LED SERIAL CLOCK
FM OUT [R]	FM OUTPUT (R)	LED CKS	LED SERIAL CLOCK
FM PACK OUT [L]	FM PACK OUTPUT (L)	LED DATA	LED SERIAL DATA
FM PACK OUT [R]	FM PACK OUTPUT (R)	LINE IN 1 [L]	LINE INPUT 1 (L)
FM/BS SEL [L]	FM/BS SELECT (L)	LINE IN 1 [R]	LINE INPUT 1 (R)
FM/BS SEL [R]	FM/BS SELECT (R)	LINE IN 2 [L]	LINE INPUT 2 (L)
FS. CLK	FS CLOCK	LINE IN 2 [R]	LINE INPUT 2 (R)
FUL. E [H]	FULL ERASE HEAD ON Ⓗ	LINE IN V	LINE INPUT VIDEO
FULL. E [H]	FULL ERASE HEAD ON Ⓗ	LINE IN [L]	LINE INPUT (L)

LINE IN [R]	LINE INPUT (R)	P-OFF [H]	POWER OFF Ⓗ
LINE OUT [L]	LINE OUTPUT (L)	P-OFF [L]	POWER OFF Ⓛ
LINE OUT [R]	LINE OUTPUT (R)	P. FAIL	POWER FAILURE DETECT
LP [H]	LP Ⓗ	P. OFF [H]	POWER OFF Ⓗ
LPTRI [L]	LP TRICK PLAY Ⓛ	P. OFF [L]	POWER OFF Ⓛ
Lch/A. DUB	Lch/AUDIO DUBBING	PAL [H]	PAL Ⓗ
M GND	MOTOR GND	PAL [L]/NTSC [H]	PAL Ⓛ/NTSC Ⓗ
M REG	MOTOR REGULATOR	PB ADJ OUT	PLAYBACK ADJUST OUTPUT
MAIN OUT	MAIN OUTPUT	PB OUT	PLAYBACK OUTPUT
MAIN [L]	MAIN Ⓛ	PB. H	PLAYBACK Ⓗ
MAIN/MONO	MAIN/MONAURAL	PFG	PG/FG
MAX IN	MAXIMAM INPUT	PHOTSN +B	PHOTO SENSOR +B
MES [H]	MESECAM Ⓗ	PICT. CNT	PICTURE CONTROL
MESE [H]	MESECAM Ⓗ	PLAY LED/RVS LED	PLAY LED/REVERSE LED
MESE [L]	MESECAM Ⓛ	PLAY. PO	PLAY POSITION
METER 5V	LEVEL METER 5V	PLAY/R. LED	PLAY LED/REVERSE LED
METER [L]	LEVEL METER (L)	PLY/DEW	PLAY/DEW Ⓗ
METER [R]	LEVEL METER (R)	POWER OFF [L]	POWER OFF Ⓛ
METER. L/AVS	LEVEL METER (L)	PREROLL [H]	PREROLL Ⓗ
METER. R/AVC	LEVEL METER (R)	PWRFAIL	POWER FAILURE DETECT
MI/BI [L]	MIX Ⓗ/BILIGUAL	R. CH [H]	Rch Ⓗ
MIC GND	MIC GND	R. CH [L]	Rch Ⓛ
MIC IN	MIC INPUT	R. ST	RESET
MIC IN [L]	MIC INPUT (L)	R/S/F	REVERSE Ⓗ/STOP Ⓜ/FORWARD Ⓛ
MIC IN [R]	MIC INPUT (R)	RCH [H]	Rch Ⓗ
MIC [H]	MIC Ⓗ	REC 12V	RECORDING 12V
MIX [H]	MIX Ⓗ	REC CHROMA	RECORDING CHROMINANCE SIGNAL
MIX [H]/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ	REC H	RECORDING Ⓗ
MIX/CINE	MIX Ⓗ/CINEMA SOUND Ⓛ	REC IN	RECORDING INPUT
MIX/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ	REC OUT [L]	RECORDING OUTPUT Ⓛ
MN. H/M. L	MONAURAL Ⓗ/MAIN Ⓛ	REC START	RECORDING START
MN. H/MAI. L	MONAURAL Ⓗ/MAIN Ⓛ	REC VR [C]	RECORDING VOLUME (COMMON)
MN2/MES. L	MONAURAL 2/MESECAM Ⓛ	REC VR [L]	RECORDING VOLUME (L)
MODE SEL	AUDIO MODE SELECT	REC VR [R]	RECORDING VOLUME (R)
MODE SW	AUDIO MODE SW	REC Y	RECORDING LUMINANCE SIGNAL
MODE. S. IN	AUDIO MODE SELECT INPUT	REC [H]	RECORDING Ⓗ
MODE. S. OUT	AUDIO MODE SELECT OUTPUT	REC. C	RECORDING CHROMINANCE SIGNAL
MONO [H]	MONAURAL Ⓗ	REC. Y	RECORDING LUMINANCE SIGNAL
MONO [H]/MAIN [L]	MONAURAL Ⓗ/MAIN Ⓛ	REC/EE CTL	RECORDING/EE CONTROL
MONO2 [L]	MONAURAL 2	REEL-T	REEL PULSE (TAKE-UP)
MONO2/MESE [FM(L)]	MONAURAL 2/MESECAM (FM Ⓛ)	REEL-S	REEL PULSE (SUPPLY)
MOTOR GND	MOTOR GND	REGULATOR FILTER	REGULATOR FILTER
MUTE	MUTE	RESET	RESET
N. A. REC [L]	NORMAL AUDIO RECORDING	REV M F/R	REVIEW MOTOR FORWARD/REVERSE
N. SW 12V	NON SW 12V		
N. SW. 5. DET	NON SW 5V DETECT	REV M V1	REVIEW MOTOR V1
NICAM	NICAM	REV M V2	REVIEW MOTOR V2
NICAM [L]	NICAM Ⓛ	REV MOTOR F/R	REVIEW MOTOR FORWARD/REVERSE
NOL [H]	PAL Ⓗ/4.43 NTSC Ⓜ/3.58 NTSC Ⓛ		
NOR/SOFT [H]	NORMAL/SOFT TAPE PLAY Ⓗ	REV MOTOR V1	REVIEW MOTOR V1
NORMAL [H]	NORMAL Ⓗ	REV MOTOR V2	REVIEW MOTOR V2
NR BIAS	NR BIAS	REV MOTOR [+]	REVIEW MOTOR (+)
NTSC [L]	NTSC Ⓛ	REV MOTOR [–]	REVIEW MOTOR (+)
OCH	CONTROL AGC CIRCUIT	REV. M. GND	REVIEW MOTOR GND
OUT	OUTPUT	RF. CHROMA	RF CHROMINANCE SIGNAL

RF OUT	RF OUTPUT
RF Y	RF LUMINANCE SIGNAL
RF. Y. IN	RF LUMINANCE SIGNAL INPUT
RF. Y. OUT	RF LUMINANCE SIGNAL OUTPUT
ROTAR. SW	ROTARY SW
ROTARY	ROTARY SW
RST	RESET
RST [L]	RESET Ⓛ
Rch/INST	Rch/INSERT
S IN	SERIAL DATA INPUT
S OUT	SERIAL DATA OUTPUT
S-PHOTO	SUPPLY PHOTO TRANSISTOR
S-RL. PLS	SUPPLY REEL PULSE
S. CLK	SERIAL CLOCK
S. CLK/AV	SERIAL CLOCK/AV
S. DATA	SERIAL DATA
S. DATA/A	SERIAL DATA
S. PHOTO	SUPPLY PHOTO TRANSISTOR
S. TAB [L]	SAFETY TAB SW ON Ⓛ
S/P/N	SECAM/PAL/NTSC
SC IN	SERIAL CLOCK INPUT
SC OUT	SERIAL CLOCK OUTPUT
SCK SELECT	SERIAL CLOCK SELECT
SEL OUT [L]	SELECT OUTPUT (L)
SEL OUT [R]	SELECT OUTPUT (R)
SHUTTLE 1	SHUTTLE 1
SIF	SOUND INTERMEDIATE FREQUENCY
SLMUT [H]	INPUT SELECT MUTE Ⓗ
SLNID [+]	SOLENOID (+)
SLNID [–]	SOLENOID (–)
SLW TR. MM	SLOW TRACKING MONO MULTI
SLW TR. REF	SLOW TRACKING REFERENCE VOLTAGE
SNS. GND	SENSOR GND
SOFT [H]	SOFT TAPE PLAY Ⓗ
SOFT [H]/NORMAL	SOFT TAPE PLAY Ⓗ/NORMAL Ⓗ
SOLENOID ON [L]	SOLENOID ON Ⓛ
SP [H]	SP Ⓗ
SP/L/SLP	SP/LP
SSS [L]	SLOW/STILL/STOP
STEREO LED	STEREO LED
STEREO [H]	STEREO Ⓗ
STEREO [L]	STEREO Ⓛ
STOP. PO	STOP POSITION
STOP/5V	STOP POSITION/5V
STOP1/TAPE SEL	STOP1 POSITION/TAPE SELECT
STOP1/PAL:ST	STOP1 POSITION/PAL
STOP2. PO	STOP 2 POSITION
STOP2/S-TAB	STOP 2 POSITION/SAFETY TAB SW
STREO [H]	STEREO Ⓗ
SUB BIAS	SUB BIAS
SUB. SW	SUB SW
SVHS CAS [L]	S-VHS CASSETTE Ⓛ
SW. 5. DET	SW 5V DETECT
SYNC [L]	SYNC Ⓛ
SYSCON 5V	SYSTEM CONTROL 5V
SYSTEM	SYSTEM SW
T-PHOTO	TAKE-UP PHOTO TRANSISTOR
T-RL. PLS	TAKE-UP REEL PULSE
T. BUSCLK	TIMER BUS CLOCK
T. BUSLSN	TIMER BUS LISTEN
T. BUSTLK	TIMER BUS TALK
T. END [L]	TAPE END Ⓛ
T. PHOTO	TAKE-UP PHOTO TRANSISTOR
TAPE END [L]	TAPE END Ⓛ
TAPE END [L]/CAM	TAPE END Ⓛ/CAMERA PAUSE
TEST	TEST MODE
TPZ	TRAPEZOIDAL WAVE CIRCUIT
TRIC [L]	TRIC PLAY Ⓛ
TRICK [L]	TRIC PLAY Ⓛ
TRK. ENV	AUTO TRACKING ENVELOPE DETECT
TU. AUDIO	TUNER AUDIO
TU. GND	TUNER GND
TU. V. IN	TUNER VIDEO SIGNAL INPUT
TU. VIDEO	TUNER VIDEO
TUN NOR IN	TUNER NORMAL INPUT
TUN R	TUNER AUDIO (R)
TUN. AUDIO IN	TUNER AUDIO INPUT
TUNER 12V	TUNER 12V
TUNER L	TUNER AUDIO (L)
TUNER V IN	TUNER VIDEO SIGNAL INPUT
TUNER [L]	TUNER AUDIO (L)
TUNER [N]	TUNER AUDIO (NORMAL)
TUNER [R]	TUNER AUDIO (R)
TUNER. 12	TUNER 12V
TUOFF [H]	TUNER OFF Ⓗ
TV. AUDIO	TV AUDIO
TV/VTR	TV/VTR
TXTON [L]	TEXT ON Ⓛ
U. REG45V	UNREGULATOR 45V
UNREG	UNREGULATOR
UNREG19V	UNREGULATOR 19V
V. REF	REFERENCE VOLTAGE
V. EE [H]	VIDEO EE Ⓗ
V. EE [L]	VIDEO EE Ⓛ
VCO REF	REFERENCE OSCILLATER
VD. IN	VIDEO SIGNAL INPUT
VD. OUT	VIDEO SIGNAL OUTPUT
VIDEO EE [L]	VIDEO EE Ⓛ
VIDEO IN	VIDEO SIGNAL INPUT
VIDEO OUT	VIDEO SIGNAL OUTPUT
VM	MOTOR VOLTAGE
VM DOWN [L]	MOTOR VOLTAGE DOWN Ⓛ
VSS	VERTICAL SYNC SIGNAL
VTR [H]	VTR Ⓗ
VTR. 12V	VTR 12V
X IN	OSCILLATOR INPUT
X OUT	OSCILLATOR OUTPUT

12 Appendix for Schematic Diagram

12.1. Voltage and Waveform Chart

12.1.1. Power & Digital I/F P.C.B.

Ref No.	IC11201									IC11301						IC11502				
MODE	1	2	3	4	5	6	7	9		1	2	3	4	5		1	2	3		
REC	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
PLAY	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
STOP	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
Ref No.	IC11601									IC11701										
MODE	1	2	3	4	5	6	7	8		1	2	3								
REC	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
PLAY	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
STOP	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
Ref No.	IC11720									IC11801										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
REC	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
PLAY	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
STOP	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
Ref No.	IC31501						IC31503													
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8						
REC	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
PLAY	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
STOP	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
Ref No.	IC37001									IC37501										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
REC	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
PLAY	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
STOP	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
Ref No.	IC45001																			
MODE	1	2	3	4	5															
REC	1.2	0	4.7	5.9	5.0															
PLAY	1.2	0	4.7	5.9	5.0															
STOP	1.2	0	4.7	5.9	5.0															
Ref No.	Q11101					Q11301					Q11502									
MODE	1	2	3	4		1	2	3	4		E	C	B							
REC	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
PLAY	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
STOP	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
Ref No.	Q11601									Q11602										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6					
REC	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
PLAY	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
STOP	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
Ref No.	Q11801							Q37001				Q37501					Q37502			
MODE	1	2	3	4	5	6		1	2	3		E	C	B			E	C	B	
REC	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7		3.3	4.9	3.3			3.3	4.9	3.3	
PLAY	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7		3.3	4.9	3.3			3.3	4.9	3.3	
STOP	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7		3.3	4.9	3.3			3.3	4.9	3.3	
Ref No.	Q37503				Q37505				Q37506				Q37507							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
REC	3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3					
PLAY	3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3					
STOP	3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3		3.3	4.9	3.3					
Ref No.	QR11501				QR11601				QR11602				QR11603							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
REC	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					
PLAY	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					
STOP	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					

12.1.2. Main P.C.B.

Ref No.	IC1511					IC1512					IC2001									
MODE	1	2	3	4		1	2	3	4		1	2	3	4						
REC	1.2	2.4	0.2	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
PLAY	1.2	2.4	0.1	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
STOP	1.2	2.4	0.2	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
Ref No.	IC2501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	12.2	0.1	0	0.1	0	0	16.1	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.8
PLAY	12.2	0.1	0	0.1	0	0	16.2	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.6
STOP	12.2	0.1	0	0.1	0	0	16.2	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.6
Ref No.	IC2501																			
MODE	21	22	23	24	25	26	27													
REC	12.2	3.8	3.8	0	3.8	0	0													
PLAY	12.2	3.6	3.6	0	3.6	0	0													
STOP	12.2	3.6	3.6	0	3.6	0	0													
Ref No.	IC3001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
PLAY	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
STOP	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
Ref No.	IC3001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.7	5.0	2.3	0.1	0	2.9	0	0	2.4	2.8	0.4	2.2	2.0	1.7	3.0	2.3	3.0	2.1	1.4	2.1
PLAY	2.7	5.0	2.3	0.1	0	2.9	0	0	2.4	2.8	0.4	2.2	2.0	1.7	3.0	2.3	3.0	2.1	1.4	2.1
STOP	2.7	5.0	2.3	0	0	3.0	0	0	2.4	2.8	0.4	2.2	2.1	1.7	3.0	2.3	3.0	2.1	1.5	2.1
Ref No.	IC3001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	3.1	5.0	1.9	5.0	2.6	0	1.9	0	2.2	2.2	5.0	5.0
PLAY	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	3.1	5.0	1.9	5.0	2.6	0	1.9	0	2.2	2.2	5.0	5.0
STOP	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	0	5.0	1.9	**5.0**	2.6	0	1.9	0	2.2	2.2	5.0	5.0
Ref No.	IC3001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	2.0	2.7	0	5.0	0	2.4	2.8	2.2	2.8	0	0	2.6
PLAY	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	2.0	2.7	0	5.0	0	2.4	2.8	2.2	2.8	0	0	2.6
STOP	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	0	2.7	0	0	2.9	2.4	2.7	2.2	2.8	5.0	0	2.4
Ref No.	IC3001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0.7	0	3.2	4.9	2.4	2.3	2.4	0	0	0	0	5.1	0.5	2.6	2.5	2.5	0	2.3	0	2.6
PLAY	0.7	0	3.2	4.9	2.4	2.3	2.4	0	0	0	0	5.1	0.5	2.6	2.5	2.5	0	2.3	0	2.6
STOP	0.7	0	3.2	5.0	2.3	2.3	2.3	0	2.3	2.3	2.3	5.1	0.6	2.5	2.5	2.5	0	2.3	0	2.6
Ref No.	IC3002																			
MODE	1	2	3	4	5															
REC	5.7	4.6	5.1	2.7	0															
PLAY	5.7	4.6	5.1	2.7	0															
STOP	5.7	4.6	5.1	2.7	0															
Ref No.	IC3701																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
PLAY	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
STOP	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
Ref No.	IC3701																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
PLAY	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
STOP	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
Ref No.	IC3701																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
PLAY	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
STOP	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
Ref No.	IC3701																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
PLAY	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
STOP	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
Ref No.	IC4501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
PLAY	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
STOP	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
Ref No.	IC4501																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.0	2.1	0	2.1	5.1	2.1	0	4.3	3.9	3.7	1.1	2.5	2.6	0.8	2.6	0	2.0	0	0	5.1
PLAY	2.0	2.1	0	2.1	5.1	2.1	0	4.3	3.9	3.7	1.1	2.5	2.6	0.8	2.6	0	2.0	0	0	5.1
STOP	2.1	2.1	0	2.1	5.1	2.1	0	4.3	1.8	1.8	0	2.6	2.6	0.8	2.6	0	2.0	0	0	5.1
Ref No.	IC4501																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	2.9	2.4	3.3	1.6	2.5	2.5	2.5	3.6	2.5	5.1	0.1	5.9	0	0	0	5.9	12.1	6.0	0
PLAY	0	2.9	2.4	3.3	1.6	2.5	2.5	2.5	3.6	2.5	5.1	0.1	5.9	0	0	0	5.9	12.1	6.0	0
STOP	0	2.9	2.4	3.3	1.6	2.5	1.6	2.5	3.6	2.5	5.1	0.1	6.0	0	0	0	6.0	12.1	6.1	0
Ref No.	IC4501																			
MODE	61	62	63	64																
REC	2.5	2.4	2.5	2.5																
PLAY	2.5	2.4	2.5	2.5																
STOP	2.6	2.4	2.5	2.5																

Ref No.	IC4801																			
MODE	1	2	3	4	5															
REC	4.6	0	1.2	8.9	12.2															
PLAY	4.6	0	1.2	8.9	12.2															
STOP	4.6	0	1.2	8.9	12.2															
Ref No.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	0	4.9	4.9	4.8	4.6	3.2	0	4.7	4.9	0	4.9	3.8	0	4.8	0	0	4.8
PLAY	0	0	0	0	4.9	4.9	4.8	4.6	3.2	0	0	0	0	4.9	3.8	0	4.8	2.4	0	4.8
STOP	4.8	0	0	0	4.9	4.9	4.8	4.6	3.3	0	0	0	0	4.9	3.8	0	4.8	2.4	0	0
Ref No.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	4.9	0	4.3	2.0	0	4.8	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
PLAY	4.9	0	4.3	2.0	0	4.8	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
STOP	4.9	0	4.3	2.0	0	0	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
Ref No.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	0	0	4.7	4.7	0	1.4	2.1	0	1.7	5.0	1.7	5.1	2.1	1.7	2.0	0	0	0	0
PLAY	0	0	0	4.7	4.7	0	1.4	2.1	0	1.7	5.0	1.7	5.1	2.1	1.7	2.0	0	0	0	0
STOP	0	0	0	4.7	4.7	0	0	2.1	0	1.7	5.0	1.7	5.1	2.1	2.2	2.0	0	0	0	0
Ref No.	IC6001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	2.5	2.4	4.8	4.8	4.5
PLAY	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	2.5	2.4	4-8	4.8	0.2
STOP	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	0	2.4	4.8	5.0	0.2
Ref No.	IC6001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0	0	0	0	0	2.5	2.5	0	0	1.3	2.5	2.5	0	2.3	2.8	2.5	2.5	5.1	4.9	0
PLAY	0	0	0	0	0	2.5	2.5	0	0	1.3	2.5	2.5	0	2.3	2.8	2.5	2.5	5.1	4.9	0
STOP	0	0	0	0	0	2.6	2.6	0	0	1.3	2.5	2.5	0	2.5	2.5	2.5	2.5	5.1	4.9	0
Ref No.	IC6002						IC6301													
MODE	1	2	3	4	5		1	2	3	4										
REC	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
PLAY	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
STOP	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
Ref No.	IC7301																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	-	0.6	2.7	0.5	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
PLAY	-	0.6	2.7	0.7	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
STOP	-	0.6	2.7	0.7	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
Ref No.	IC7301																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32								
REC	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
PLAY	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
STOP	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
Ref No.	IC7402																			
MODE	1	2	3	4	5	6	7	8												
REC	5.0	-	0	3.2	4.9	-	-	5.7												
PLAY	5.0	-	0	3.2	4.9	-	-	5.7												
STOP	5.0	-	0	3.2	4.9	-	-	5.7												
Ref No.	IC7501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
PLAY	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
STOP	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
Ref No.	IC7501																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
PLAY	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
STOP	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
Ref No.	IC7501																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
PLAY	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
STOP	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
Ref No.	IC7501																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
PLAY	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
STOP	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
Ref No.	IC7501																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6
PLAY	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6
STOP	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6
Ref No.	IC7503																			
MODE	1	2	3	4	5															
REC	4.8	4.8	0	-	-															
PLAY	4.8	4.8	0	-	-															
STOP	4.8	4.8	0	-	-															

Ref No.	Q1501			Q1502			Q3001				Q3004				Q4001					
MODE	E	C		E	C		E	C	B		E	C	B		E	C	B			
REC	0	4.6		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		-19.4	10.4	-28.1			
PLAY	0	4.7		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		0	0	0.7			
STOP	0	4.7		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		0	0	0.7			
Ref No.	Q4002				Q4082				Q4084				Q4084				Q4501			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	-19.4	0	-28.1		0	5.1	-0.6		5.7	5.6	4.9		5.7	5.6	4.9		12.4	12.3	11.7	
PLAY	0	0	0.7		0	0.3	0.3		5.7	0.4	5.7		5.7	0.3	5.7		12.4	12.3	11.7	
STOP	0	0	0.7		0	0.3	0.3		5.7	0.4	5.7		5.7	0.3	5.7		12.4	12.3	11.7	
Ref No.	Q4502				Q6801				Q7401				Q7402				Q7501			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6		-14.9	-14.8	-14.1	
PLAY	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6		-14.9	-14.8	-14.1	
STOP	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6		-14.9	-14.8	-14.1	
Ref No.	Q7502				Q7503															
MODE	E	C	B		E	C	B													
REC	-22.8	4.8	-22.5		3.3	4.8	3.2													
PLAY	-22.8	4.8	-22.5		3.3	4.8	3.2													
STOP	-22.8	4.8	-22.5		3.3	4.8	3.2													
Ref No.	QR4001				QR4082				QR4501				QR4801							
MODE	E	C	B		E	C	B		E	C	B		1	2	3	4	5			
REC	5.1	-28.1	4.8		0	0.1	4.8		0	0	4.6		0	0	1.8	0	4.6			
PLAY	5.1	5.0	0		0	5.7	0		0	0	4.6		0	0	1.8	0	4.6			
STOP	5.1	5.0	0		0	5.7	0		0	0	4.6		0	0	1.8	0	4.6			
Ref No.	QR4802						QR4803						QR4804							
MODE	1	2	3	4	5		1	2	3	4	5		E	C	B					
REC	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
PLAY	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
STOP	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
Ref No.	QR4805						QR4806						QR4807							
MODE	1	2	3	4	5		1	2	3	4	5		E	C	B					
REC	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
PLAY	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
STOP	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
Ref No.	QR4808						QR4809				QR6801				QR7401					
MODE	1	2	3	4	5		E	C	B		E	C	B		E	C	B			
REC	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5		36.3	36.3	0.1			
PLAY	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5		36.3	36.3	0.1			
STOP	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5		36.3	36.3	0.1			
Ref No.	QR7502				QR7503															
MODE	E	C	B		E	C	B													
REC	4.9	4.8	0		4.9	0	4.8													
PLAY	4.9	4.8	0		4.9	0	4.8													
STOP	4.9	4.8	0		4.9	0	4.8													

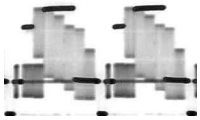
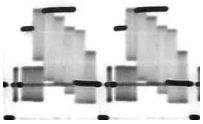
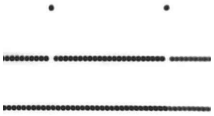
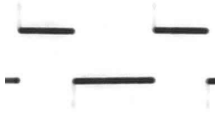
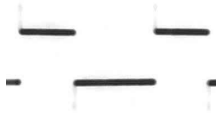
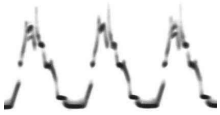
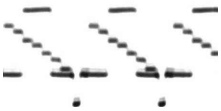
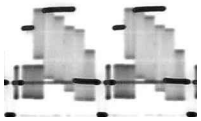
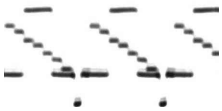
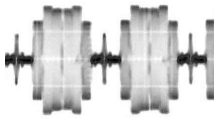
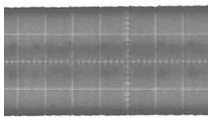
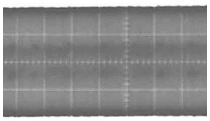
12.1.3. FL Drive P.C.B.

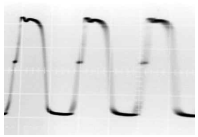
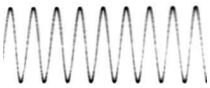
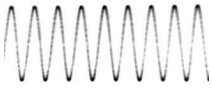
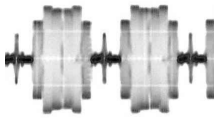
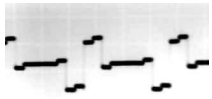
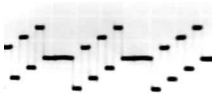
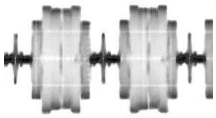
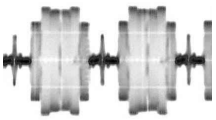
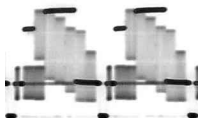
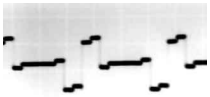
Ref No.	IC7502																			
MODE	1	2	3																	
STOP	4.7	0	4.9																	
Ref No.	Q7702				Q7703				Q7704				Q7706							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
STOP	0	4.5	0		0	0	0.8		0	4.3	0		0	4.7	0					

12.1.4. P59001 Connector

Ref No.	P59001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.1	2.5	4.7	2.5	3.3
PLAY	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.1	2.5	4.7	2.5	3.3
STOP	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.2	2.5	4.7	2.5	3.3
Ref No.	P59001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
PLAY	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
STOP	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
Ref No.	P59001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
PLAY	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
STOP	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
Ref No.	P59001																			
MODE	61	62	63	64																
REC	0	12.4	2.3	5.0																
PLAY	0	12.4	2.3	5.0																
STOP	0	12.4	2.3	5.0																

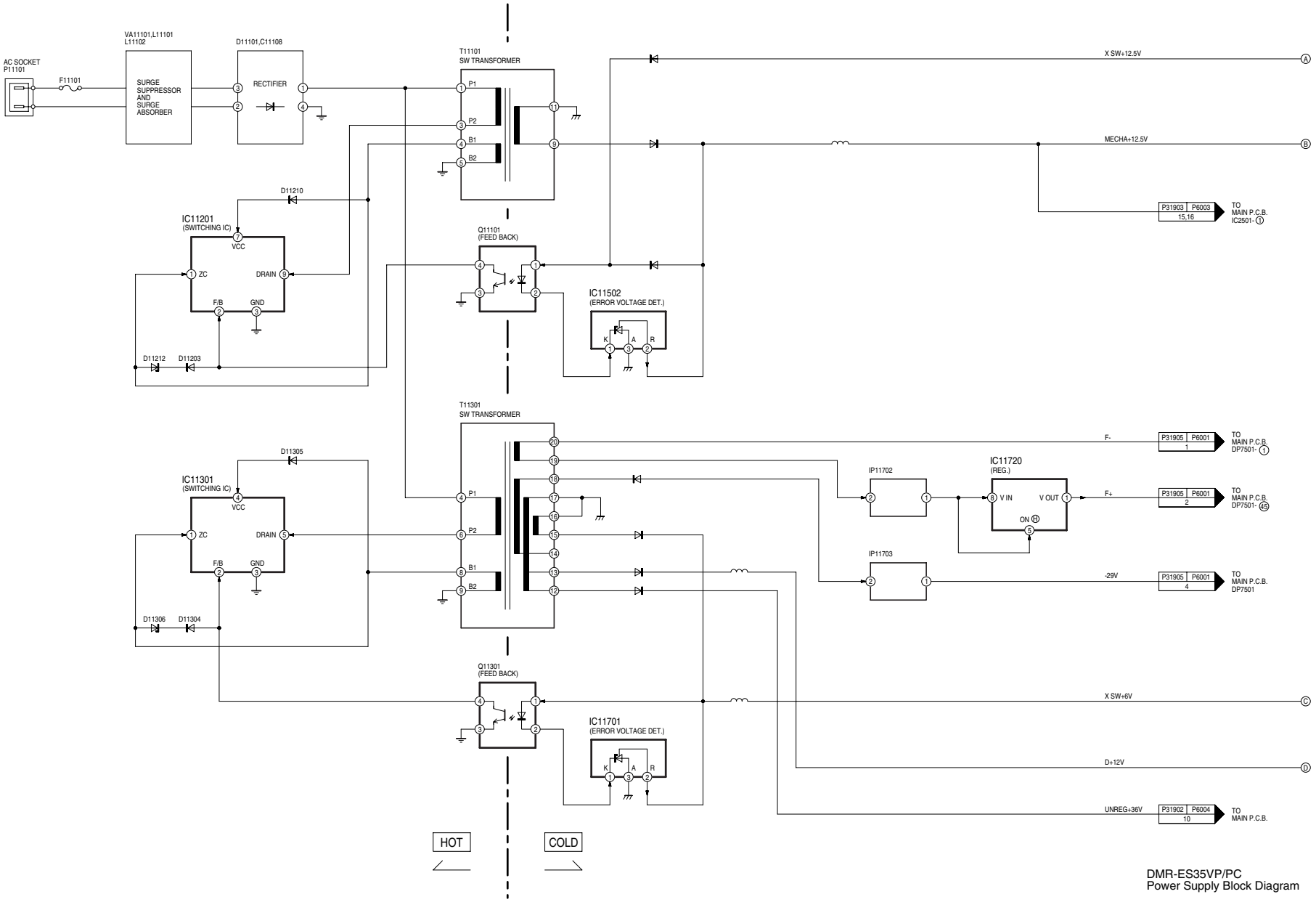
12.1.5. Waveform Chart

IC6001-18(TW2001) REC 5.0Vp-p (10msec.div.)	IC6001-19 PLAY 5.0Vp-p (5msec.div.)	 IC6001-50 REC/PLAY 2.2Vp-p (20usec.div.)	 IC6001-52 REC/PLAY 2.2Vp-p (20usec.div.)	IC6001-79 FF/REW 5.0Vp-p (1msec.div.)
IC6001-80 FF/REW 5.0Vp-p (1msec.div.)	IC6001-86(TL2015) PLAY 0.7Vp-p (0.5msec.div.)	 IC6001-90 REC 5.0Vp-p (10msec.div.)	 IC6001-94 REC 2.4Vp-p (10msec.div.)	 IC6001-95 REC 2.4Vp-p (10msec.div.)
IC6001-97(TW2002) PLAY 4.4Vp-p (5msec.div.)				
 IC2501-22,23,25 PLAY 8.0Vp-p (2msec.div.)				
IC3001-6 REC/PLAY 0.9Vp-p (2msec.div.)	 IC3001-19 REC 1.0Vp-p (20usec.div.)	 IC3001-29 REC/PLAY 2.4Vp-p (20usec.div.)	 IC3001-36 PLAY 0.5Vp-p (20usec.div.)	 IC3001-57 REC/PLAY 0.2Vp-p (20usec.div.)
IC3001-67 PLAY 0.5Vp-p (0.5usec.div.)	IC3001-80 REC/PLAY 0.5Vp-p (10msec.div.)	 IC3001-86 REC 1.4Vp-p (20usec.div.)	IC3001-98 REC 1.5Vp-p (1msec.div.)	
 IC4501-21(TW4501) REC 1.1Vp-p (20usec.div.)	IC4501-53 REC/PLAY 1.6Vp-p (0.5msec.div.)	IC4501-57 REC/PLAY 1.6Vp-p (0.5msec.div.)		

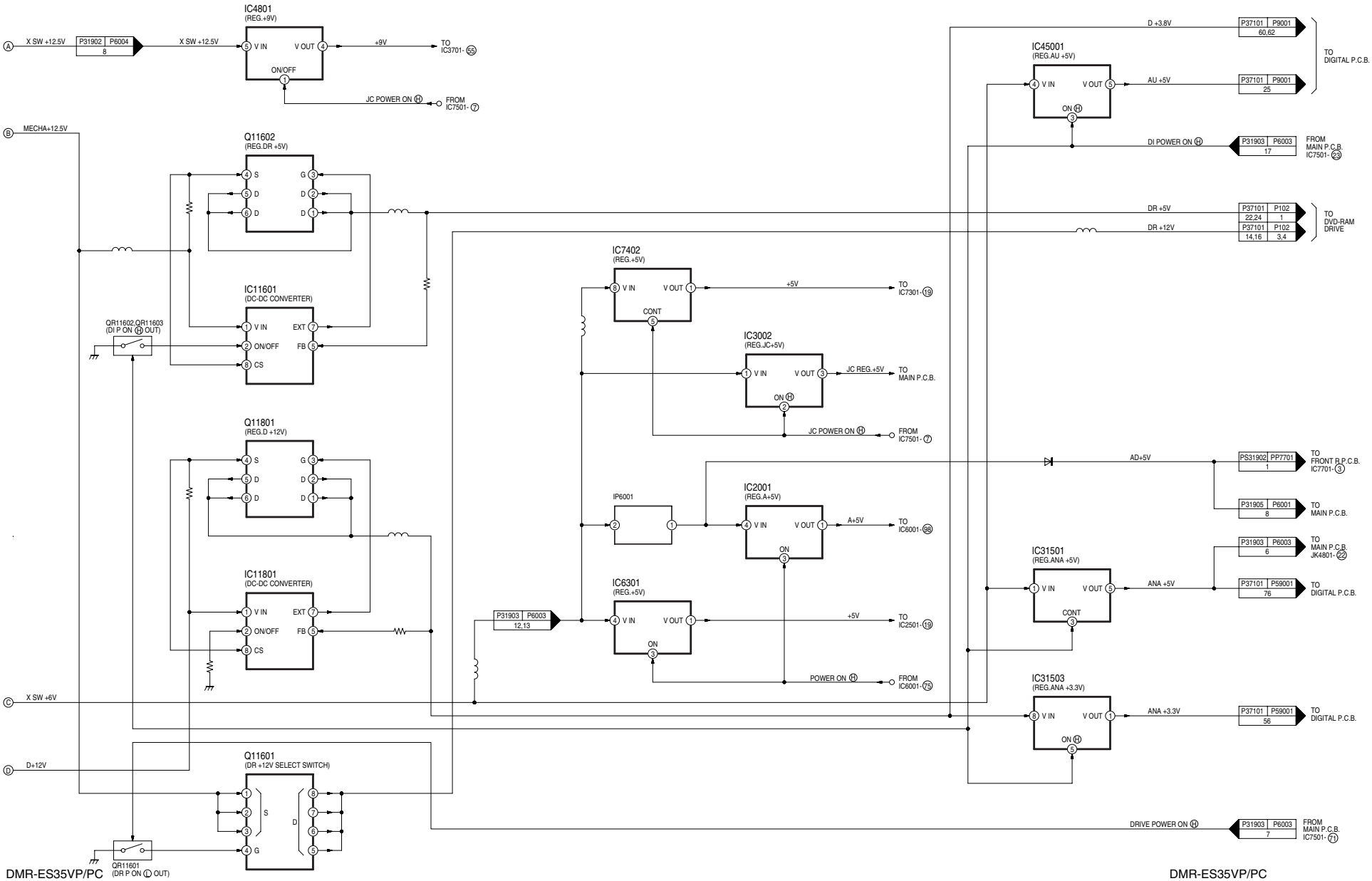
 IC11201-9 STOP 300Vp-p (5usec.div)				
T11101-1 STOP 10Vp-p (2msec.div)	T11101-4 STOP 36Vp-p (5usec.div)	T11301-6 STOP 300Vp-p (5usec.div)	T11301-8 STOP 25Vp-p (5usec.div)	
 P59001-17,19 REC/PLAY 0.8Vp-p (1msec.div)	 P59001-27,29 REC/PLAY 1.0Vp-p (1msec.div)	P59001-39 REC/PLAY 1.0Vp-p (20usec.div.)	 P59001-43 REC/PLAY 0.8Vp-p (20usec.div.)	 P59001-47 REC/PLAY 0.6Vp-p (20usec.div)
P59001-51 REC/PLAY 1.0Vp-p (20usec.div.)	 P59001-55 REC/PLAY 0.6Vp-p (20usec.div.)	P59001-59 REC/PLAY 1.0Vp-p (20usec.div.)	 P59001-63 REC/PLAY 0.8Vp-p (20usec.div)	
JK3902-3 REC/PLAY 2.0Vp-p (20usec.div)	 JK3902-4 REC/PLAY 1.5Vp-p (20usec.div)	 JK3902-16 REC/PLAY 2.0Vp-p (20usec.div)		
 JK4801-18 REC/PLAY 1.2Vp-p (20usec.div)	JK4801-19 REC/PLAY 1.2Vp-p (20usec.div)	JK4801-20 REC/PLAY 2.0Vp-p (20usec.div)		

13 Block Diagram

13.1. Power Supply Block Diagram



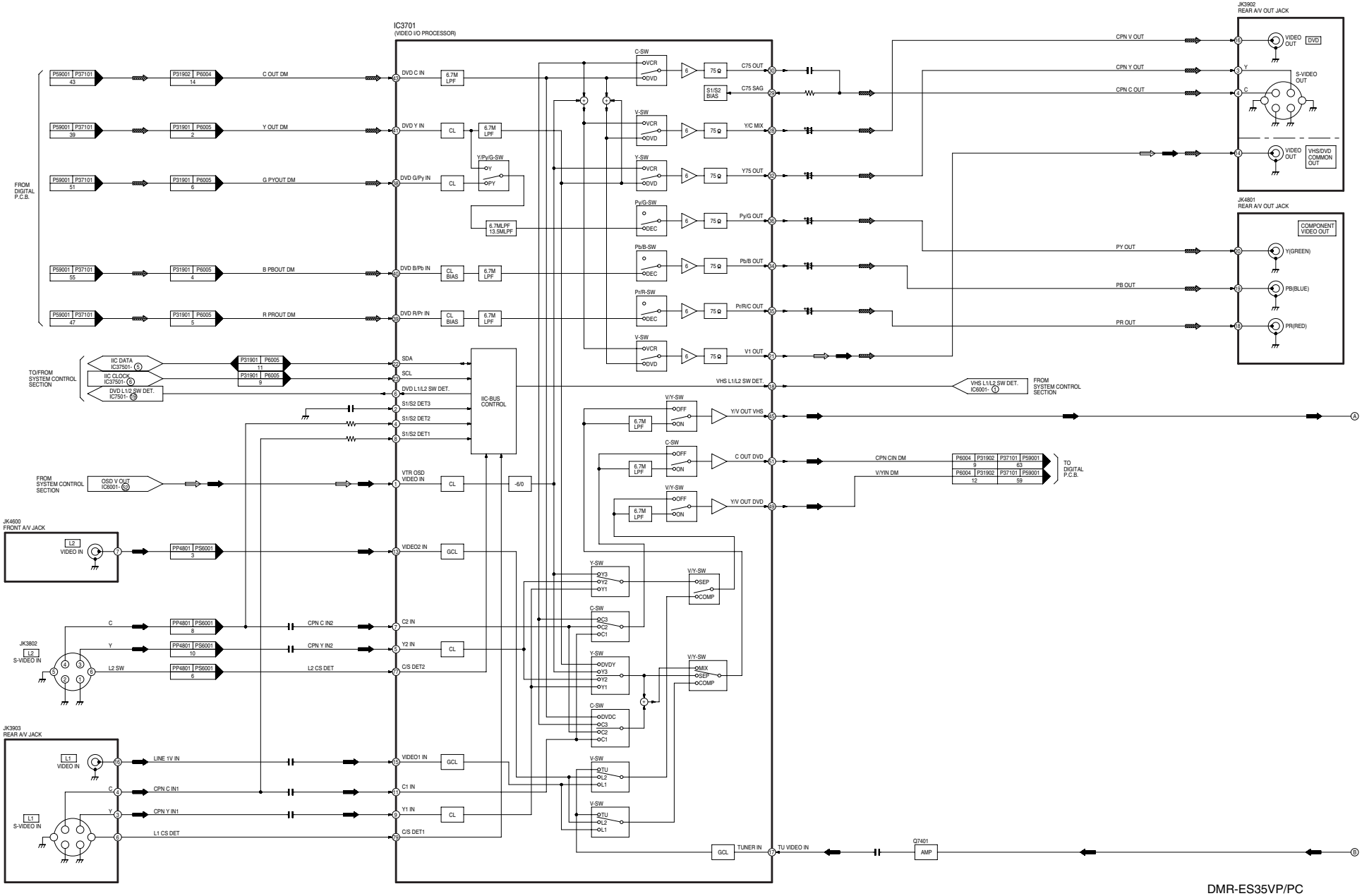
DMR-ES35VP/PC
Power Supply Block Diagram



DMR-ES35VP/PC
Power Supply Block Diagram

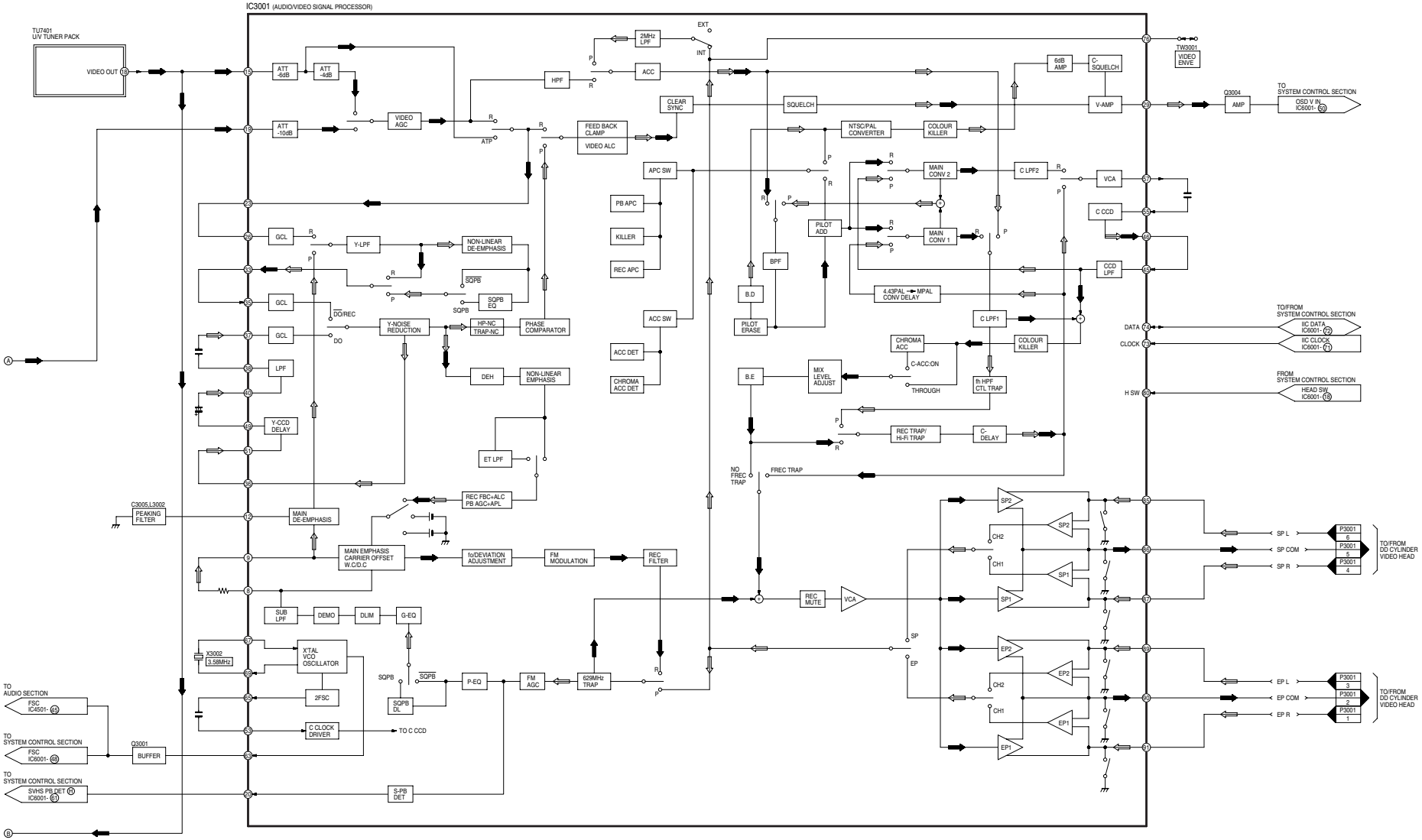
DMR-ES35VP/PC
Power Supply Block Diagram

13.2. Analog Video Block Diagram



DMR-ES35VP/PC
Analog Video Block Diagram

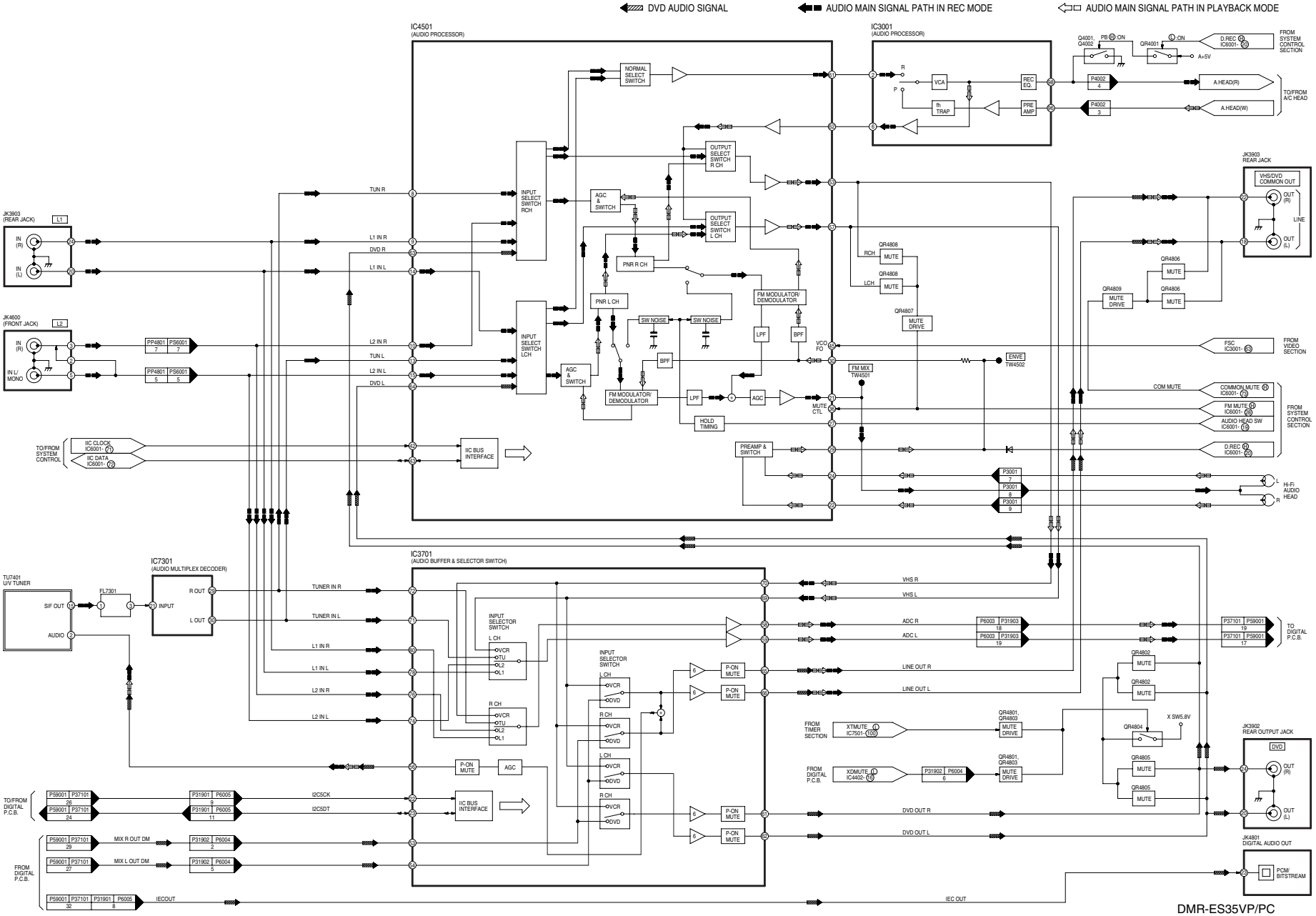
:DVD VIDEO EE SIGNAL :REC SIGNAL :PB SIGNAL



DMR-ES35VP/PC
Analog Video Block Diagram

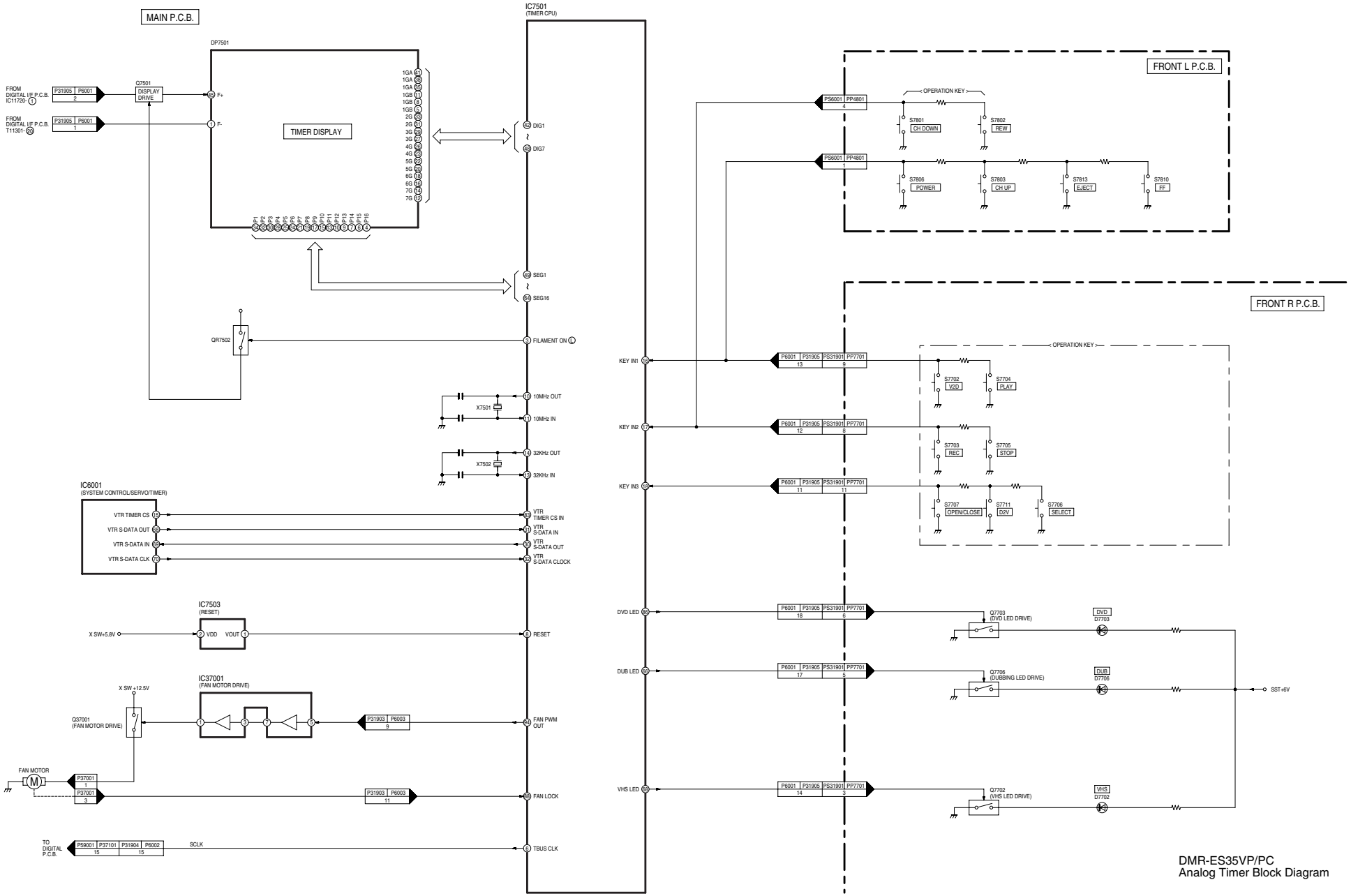
DMR-ES35VP/PC
Analog Video Block Diagram

13.3. Analog Audio Block Diagram



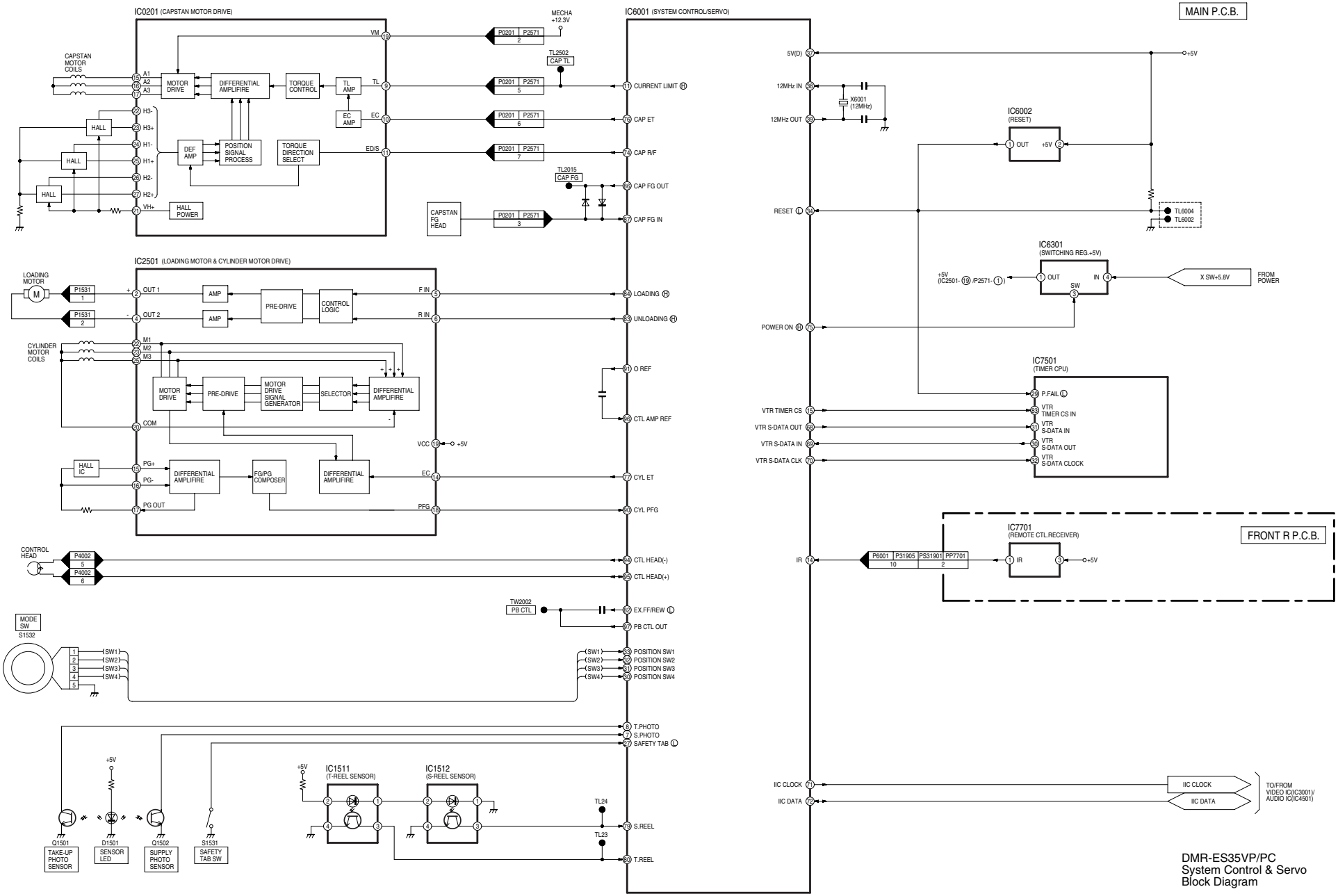
DMR-ES35VP/PC
Analog Audio Block Diagram

13.4. Analog Timer Block Diagram



DMR-ES35VP/PC
Analog Timer Block Diagram

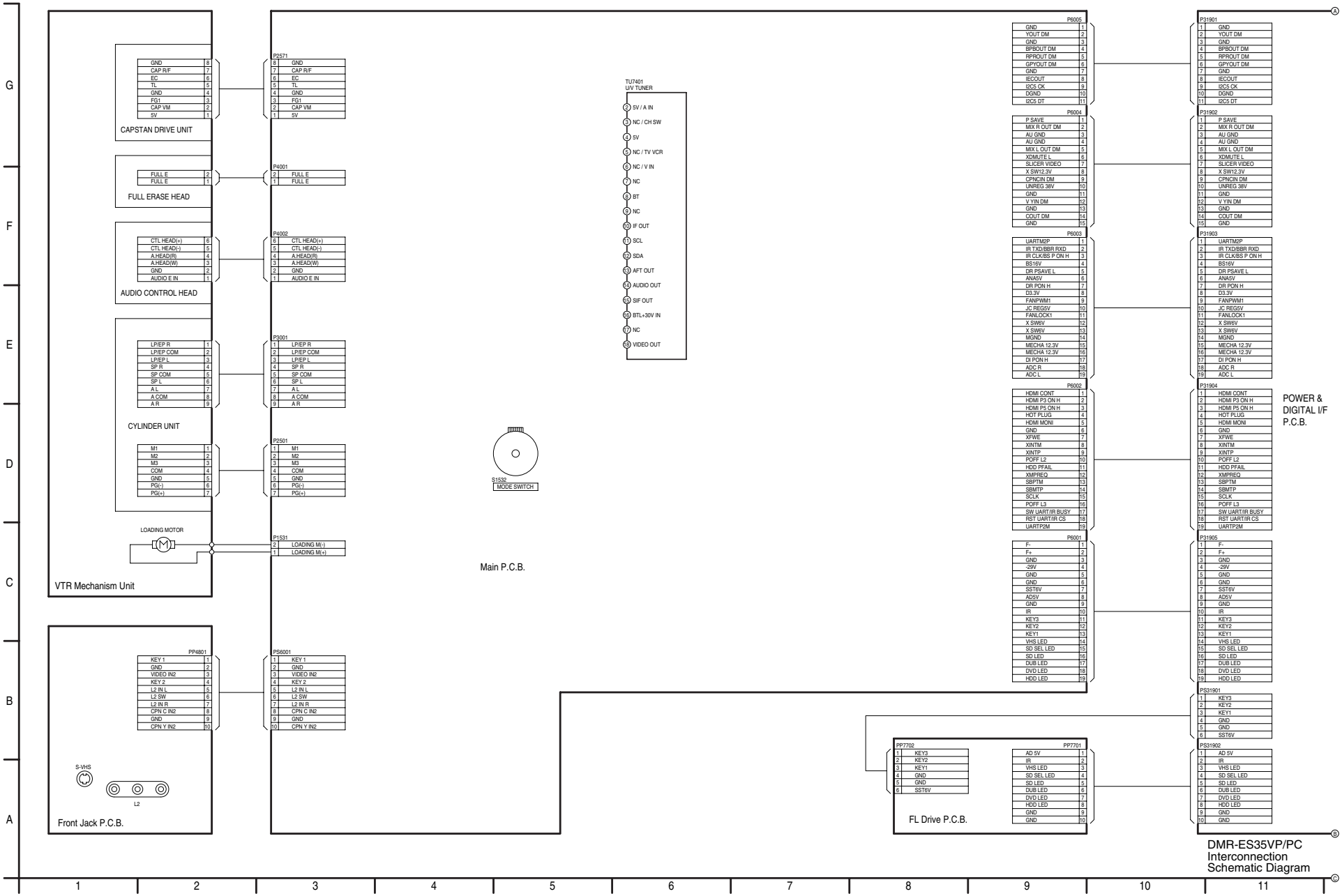
13.5. System Control & Servo Block Diagram

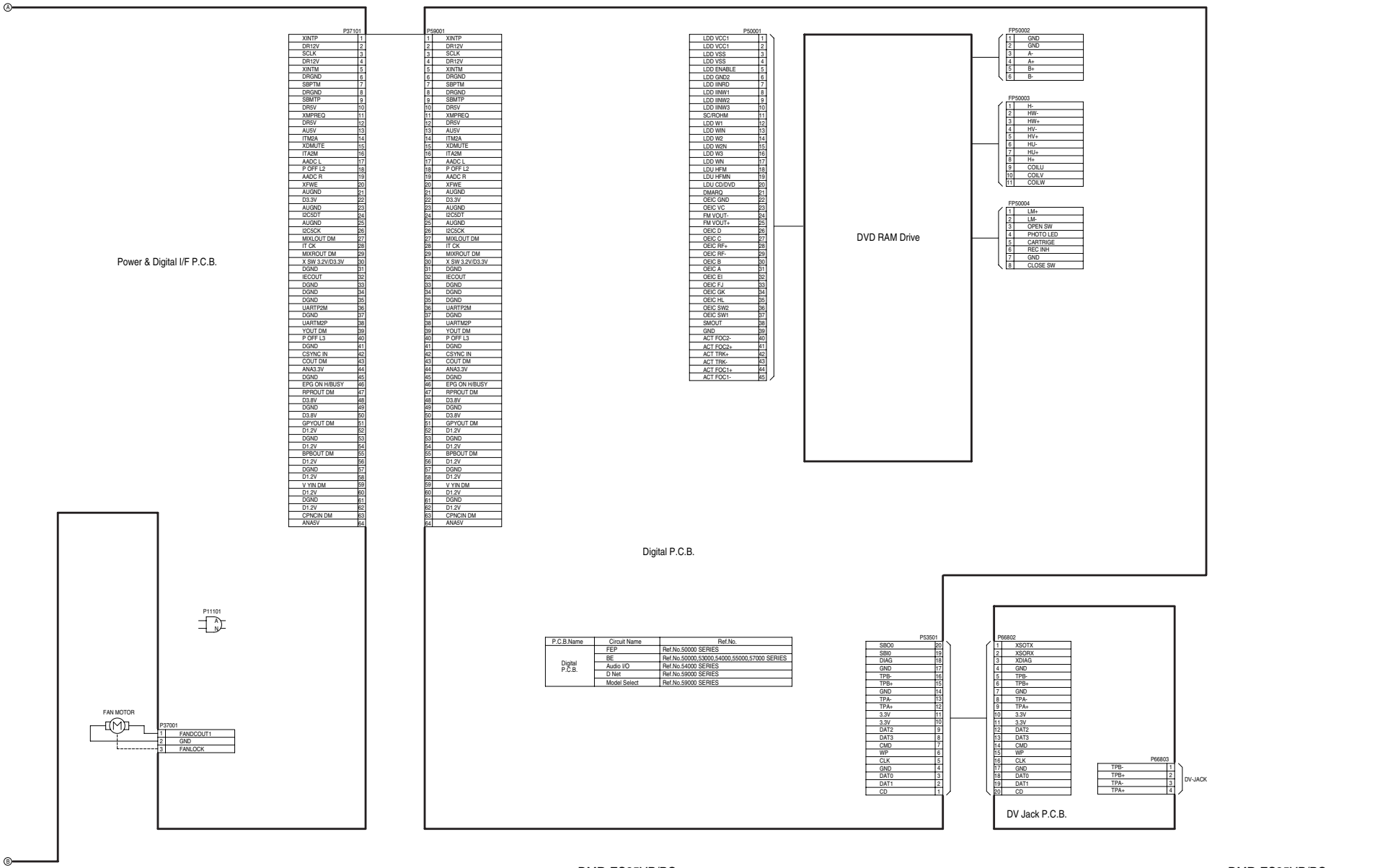


DMR-ES35VP/PC
System Control & Servo
Block Diagram

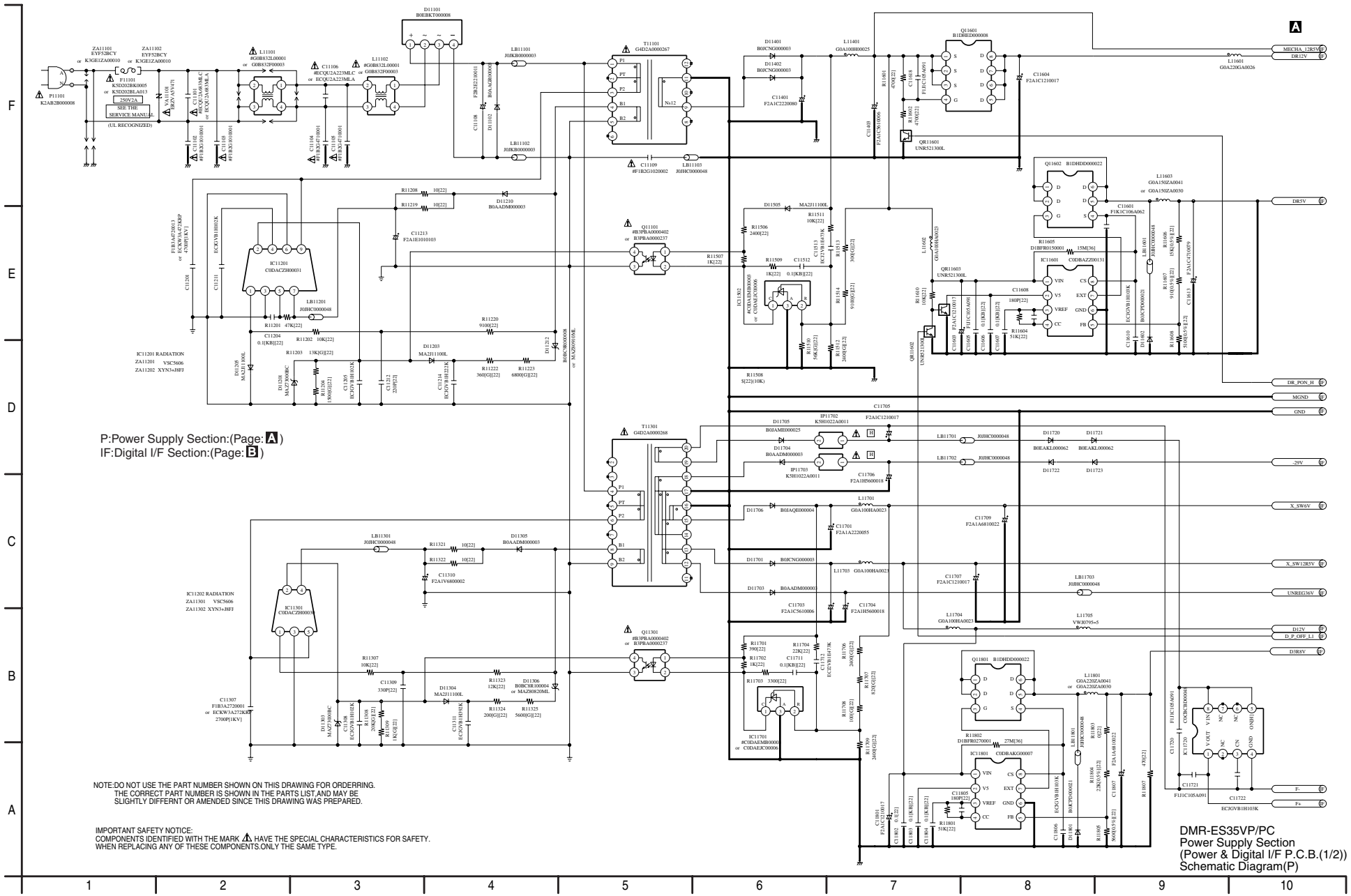
14 Schematic Diagram

14.1. Interconnection Schematic Diagram

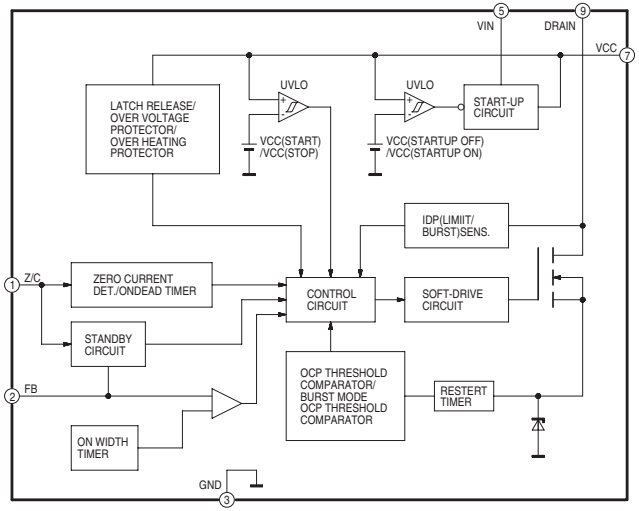



Power & Digital I/F P.C.B.
P37101
XINTP 1
DR12V 2
SCLK 3
DR12V 4
XINTM 5
DRGND 6
SBPTM 7
DRGND 8
SBMTP 9
DR5V 10
XMPREQ 11
DR5V 12
AU5V 13
ITM2A 14
XDMUTE 15
ITA2M 16
AADC L 17
P OFF L2 18
AADC R 19
XFWE 20
AUGND 21
D3.3V 22
AUGND 23
I2CSDT 24
AUGND 25
I2CSCK 26
MIXLOUT DM 27
IT CK 28
MIXROUT DM 29
X SW 3.2V/D3.3V 30
DGND 31
IECOUT 32
DGND 33
DGND 34
DGND 35
UARTP2M 36
DGND 37
UARTM2P 38
YOUT DM 39
P OFF L3 40
DGND 41
CSYNC IN 42
COUT DM 43
ANA3.3V 44
DGND 45
EPG ON H/BUSY 46
RPROUT DM 47
D3.8V 48
DGND 49
D3.8V 50
GPYOUT DM 51
D1.2V 52
DGND 53
D1.2V 54
BPBOUT DM 55
D1.2V 56
DGND 57
D1.2V 58
V YIN DM 59
D1.2V 60
DGND 61
D1.2V 62
CPNCIN DM 63
ANA5V 64
P59001
XINTP 1
DR12V 2
SCLK 3
DR12V 4
XINTM 5
DRGND 6
SBPTM 7
DRGND 8
SBMTP 9
DR5V 10
XMPREQ 11
DR5V 12
AU5V 13
ITM2A 14
XDMUTE 15
ITA2M 16
AADC L 17
P OFF L2 18
AADC R 19
XFWE 20
AUGND 21
D3.3V 22
AUGND 23
I2CSDT 24
AUGND 25
I2CSCK 26
MIXLOUT DM 27
IT CK 28
MIXROUT DM 29
X SW 3.2V/D3.3V 30
DGND 31
IECOUT 32
DGND 33
DGND 34
DGND 35
UARTP2M 36
DGND 37
UARTM2P 38
YOUT DM 39
P OFF L3 40
DGND 41
CSYNC IN 42
COUT DM 43
ANA3.3V 44
DGND 45
EPG ON H/BUSY 46
RPROUT DM 47
D3.8V 48
DGND 49
D3.8V 50
GPYOUT DM 51
D1.2V 52
DGND 53
D1.2V 54
BPBOUT DM 55
D1.2V 56
DGND 57
D1.2V 58
V YIN DM 59
D1.2V 60
DGND 61
D1.2V 62
CPNCIN DM 63
ANA5V 64
P50001
LDD VCC1 1
LDD VCC1 2
LDD VSS 3
LDD VSS 4
LDD ENABLE 5
LDD GND2 6
LDD IINRD 7
LDD IINW1 8
LDD IINW2 9
LDD IINW3 10
SC/ROHM 11
LDD W1 12
LDD WIN 13
LDD W2 14
LDD W2N 15
LDD W3 16
LDD WN 17
LDU HFM 18
LDU HFMN 19
LDU CD/DVD 20
DMARQ 21
OEIC GND 22
OEIC VC 23
FM VOUT- 24
FM VOUT+ 25
OEIC D 26
OEIC C 27
OEIC RF+ 28
OEIC RF- 29
OEIC B 30
OEIC A 31
OEIC EI 32
OEIC FJ 33
OEIC GK 34
OEIC HL 35
OEIC SW2 36
OEIC SW1 37
SMOUT 38
GND 39
ACT FOC2- 40
ACT FOC2+ 41
ACT TRK+ 42
ACT TRK- 43
ACT FOC1+ 44
ACT FOC1- 45
DVD RAM Drive
FP50002
1 GND
2 GND
3 A-
4 A+
5 B+
6 B-
FP50003
1 H-
2 HW-
3 HW+
4 HV-
5 HV+
6 HU-
7 HU+
8 H+
9 COILU
10 COILV
11 COILW
FP50004
1 LM+
2 LM-
3 OPEN SW
4 PHOTO LED
5 CARTRIGE
6 REC INH
7 GND
8 CLOSE SW
Digital P.C.B.
P.C.B.Name | Circuit Name | Ref.No.
Digital P.C.B. | FEP | Ref.No.50000 SERIES
BE | Ref.No.50000,53000,54000,55000,57000 SERIES
Audio I/O | Ref.No.54000 SERIES
D Net | Ref.No.59000 SERIES
Model Select | Ref.No.59000 SERIES
P11101
A
N
FAN MOTOR
P37001
1 FANDCOUT1
2 GND
3 FANLOCK
P53501
SBO0 20
SBI0 19
DIAG 18
GND 17
TPB- 16
TPB+ 15
GND 14
TPA- 13
TPA+ 12
3.3V 11
3.3V 10
DAT2 9
DAT3 8
CMD 7
WP 6
CLK 5
GND 4
DAT0 3
DAT1 2
CD 1
P66802
1 XSOTX
2 XSORX
3 XDIAG
4 GND
5 TPB-
6 TPB+
7 GND
8 TPA-
9 TPA+
10 3.3V
11 3.3V
12 DAT2
13 DAT3
14 CMD
15 WP
16 CLK
17 GND
18 DAT0
19 DAT1
20 CD
DV Jack P.C.B.
P66803
TPB- 1
TPB+ 2
TPA- 3
TPA+ 4
DV-JACK
DMR-ES35VP/PC
Interconnection
Schematic Diagram
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.
DMR-ES35VP/PC
Interconnection
Schematic Diagram
12 13 14 15 16 17 18 19 20 21 22

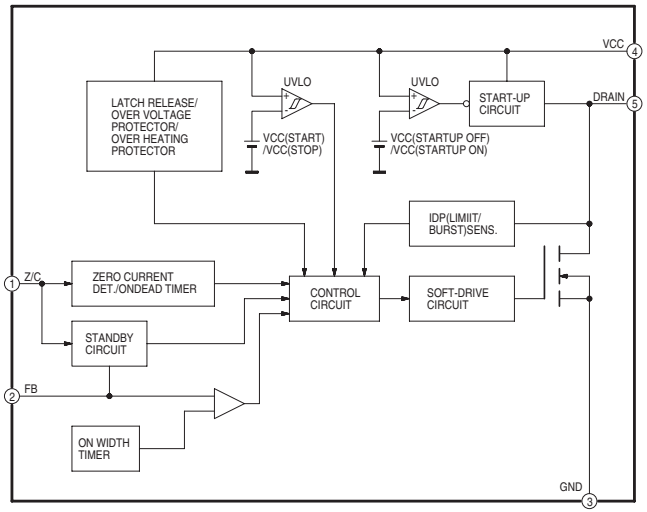
14.2. Power Supply Section (Power & Digital I/F P.C.B.(1/2)) Schematic Diagram (P)


P:Power Supply Section:(Page: A)
IF:Digital I/F Section:(Page: B)
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST.AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.
DMR-ES35VP/PC
Power Supply Section
(Power & Digital I/F P.C.B.(1/2))
Schematic Diagram(P)

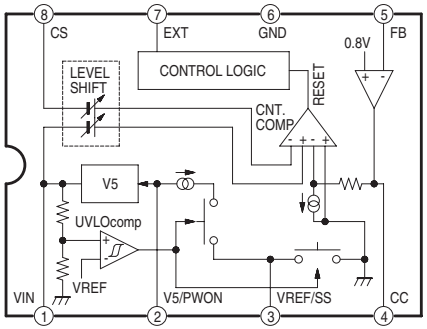
IC11201
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM



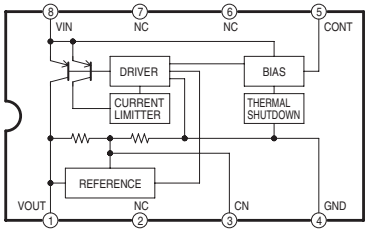
IC11301
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM



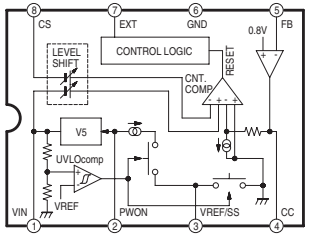
IC11601
DR +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC11720
F+ SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM

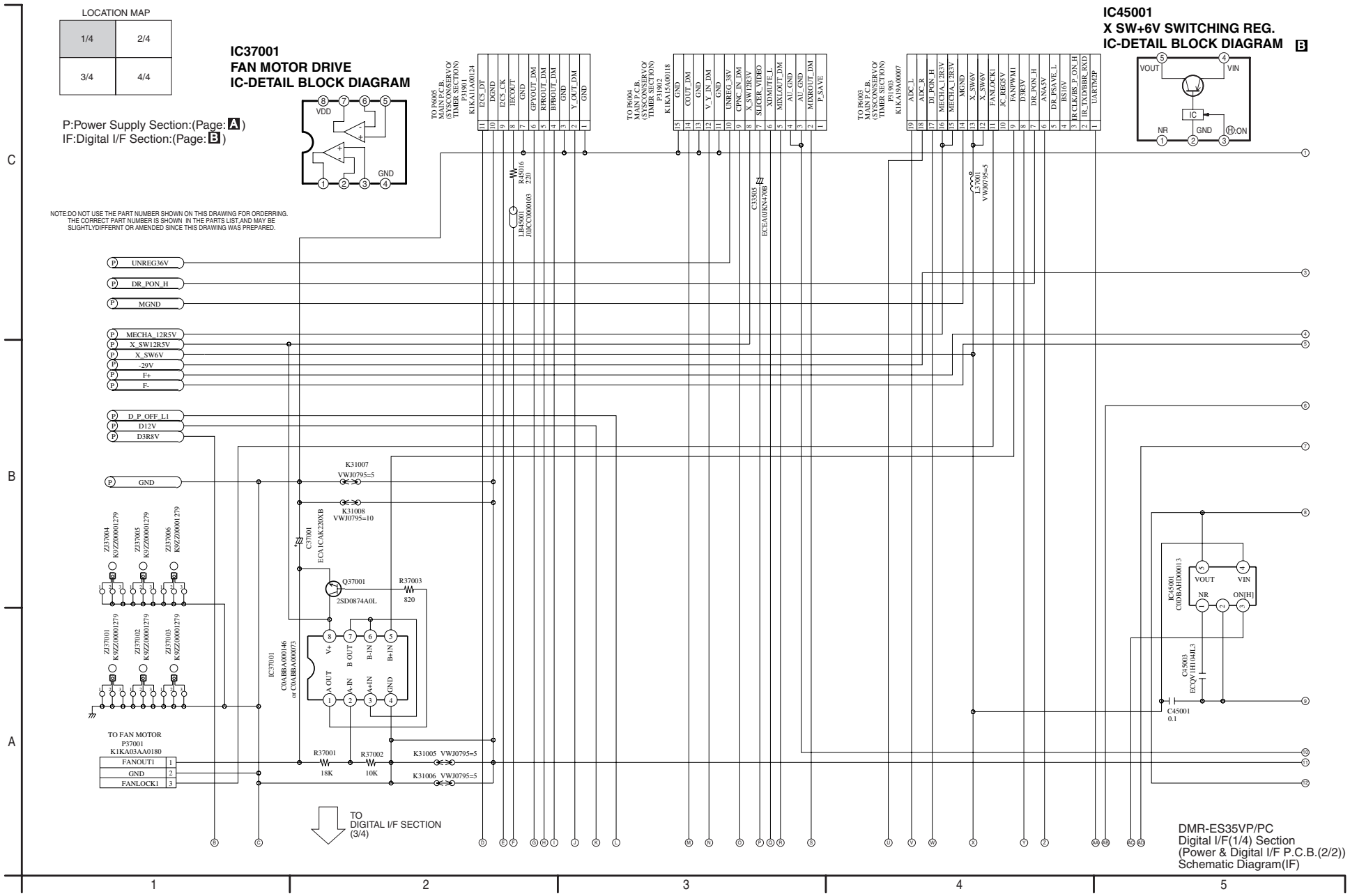


IC11801
D +3.8V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM

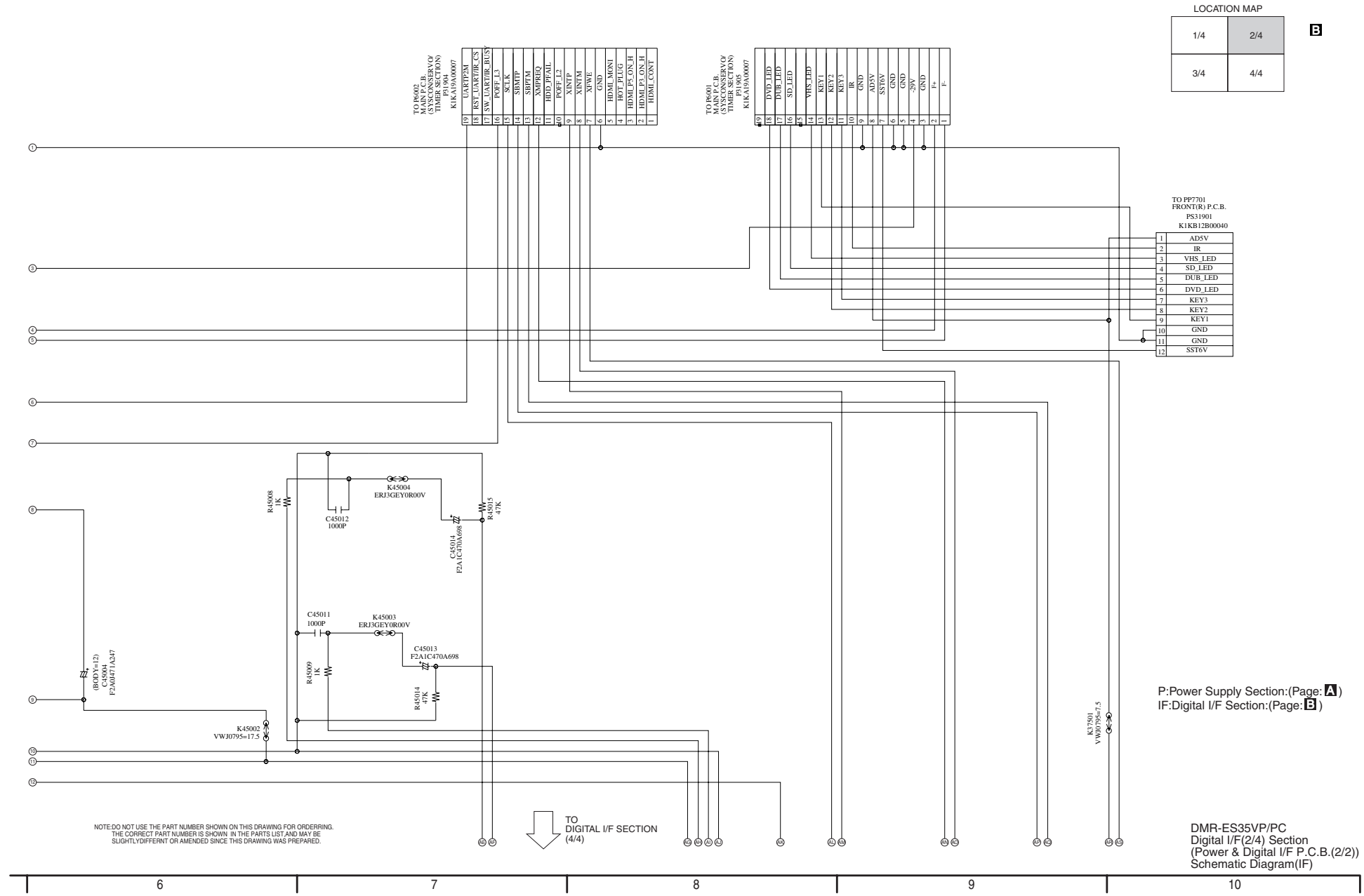


IC11201 Detail Block Diagram
IC11301 Detail Block Diagram
IC11601 Detail Block Diagram
IC11720 Detail Block Diagram
IC11801 Detail Block Diagram
DMR-ES35VP/PC IC-Detail Block Diagram

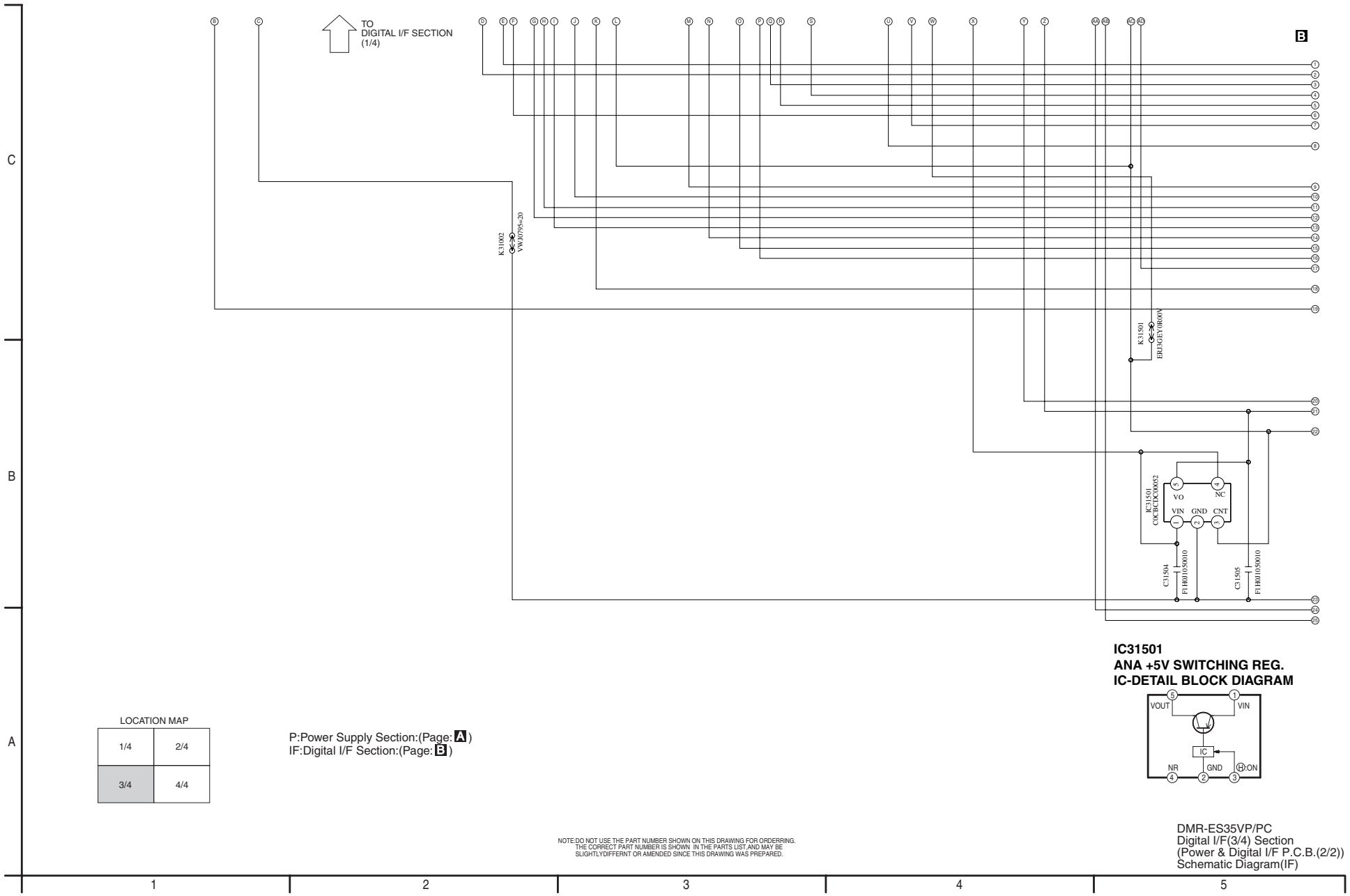
14.3. Digital I/F (1/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF)



14.4. Digital I/F (2/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF)



14.5. Digital I/F (3/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF)



IC31501
ANA +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM

LOCATION MAP

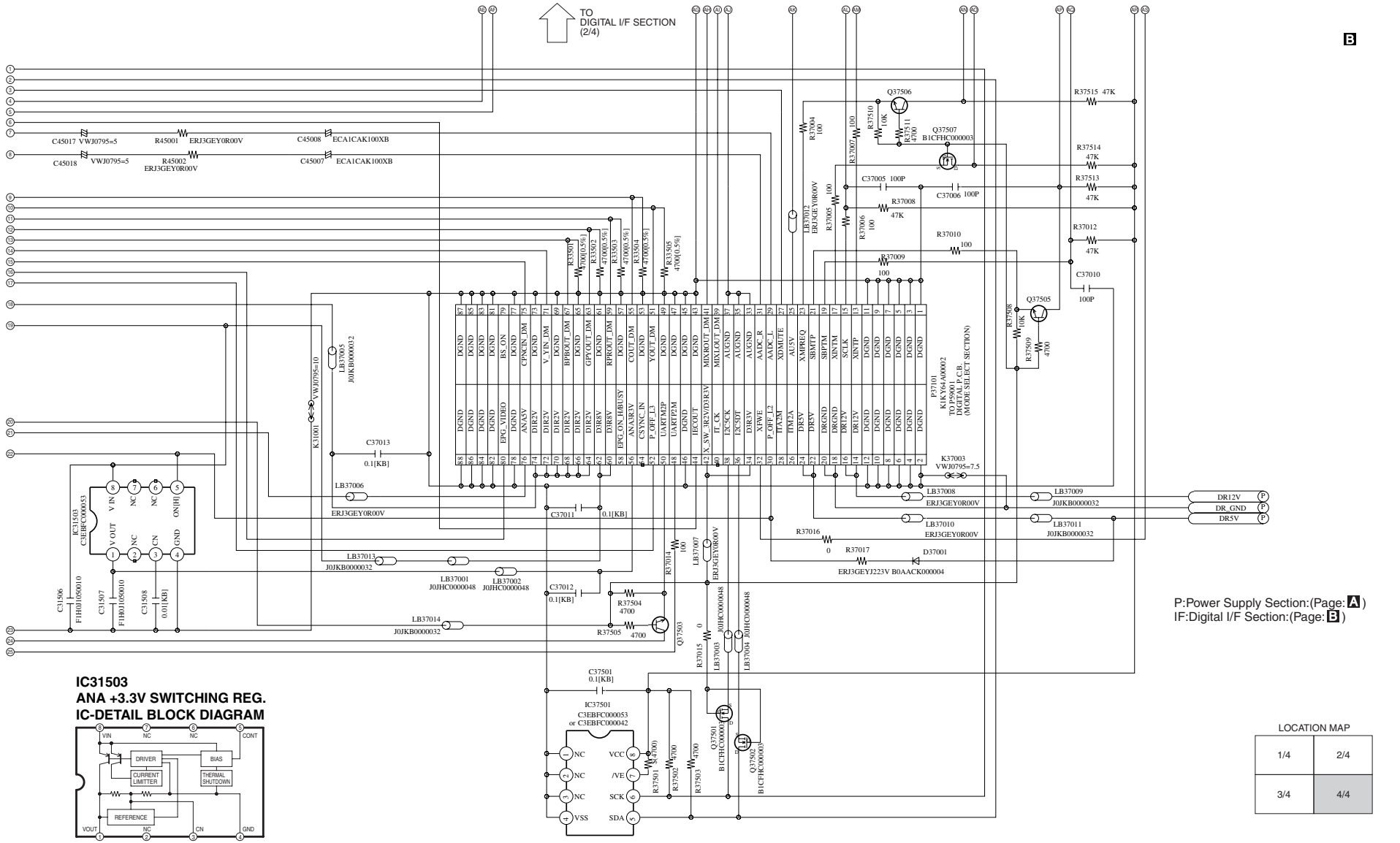
1/4	2/4
3/4	4/4

P:Power Supply Section:(Page: A)
IF:Digital I/F Section:(Page: B)

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VP/PC
Digital I/F(3/4) Section
(Power & Digital I/F P.C.B.(2/2))
Schematic Diagram(IF)

14.6. Digital I/F (4/4) Section (Power & Digital I/F P.C.B.(2/2)) Schematic Diagram (IF)



LOCATION MAP

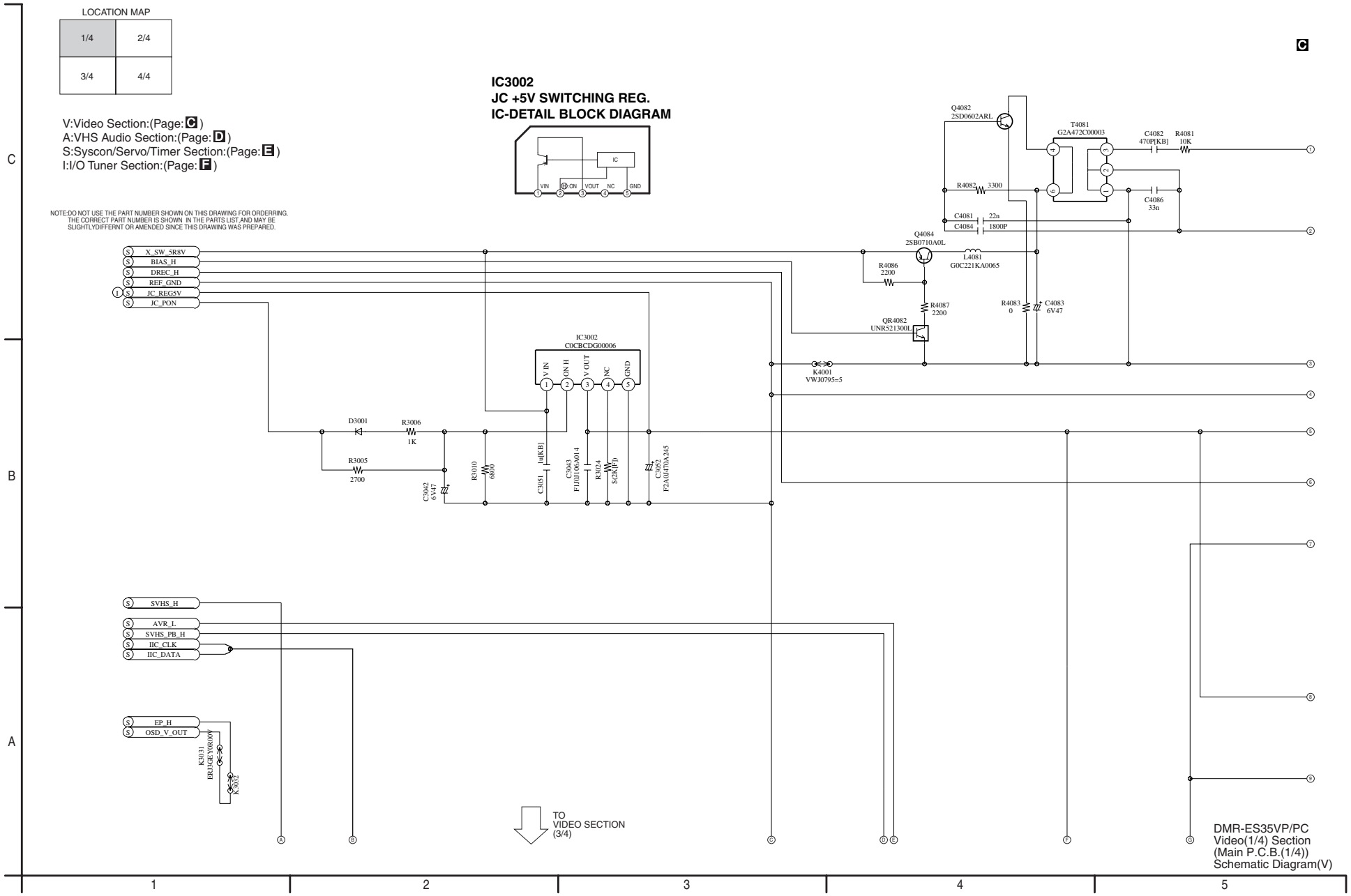
1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

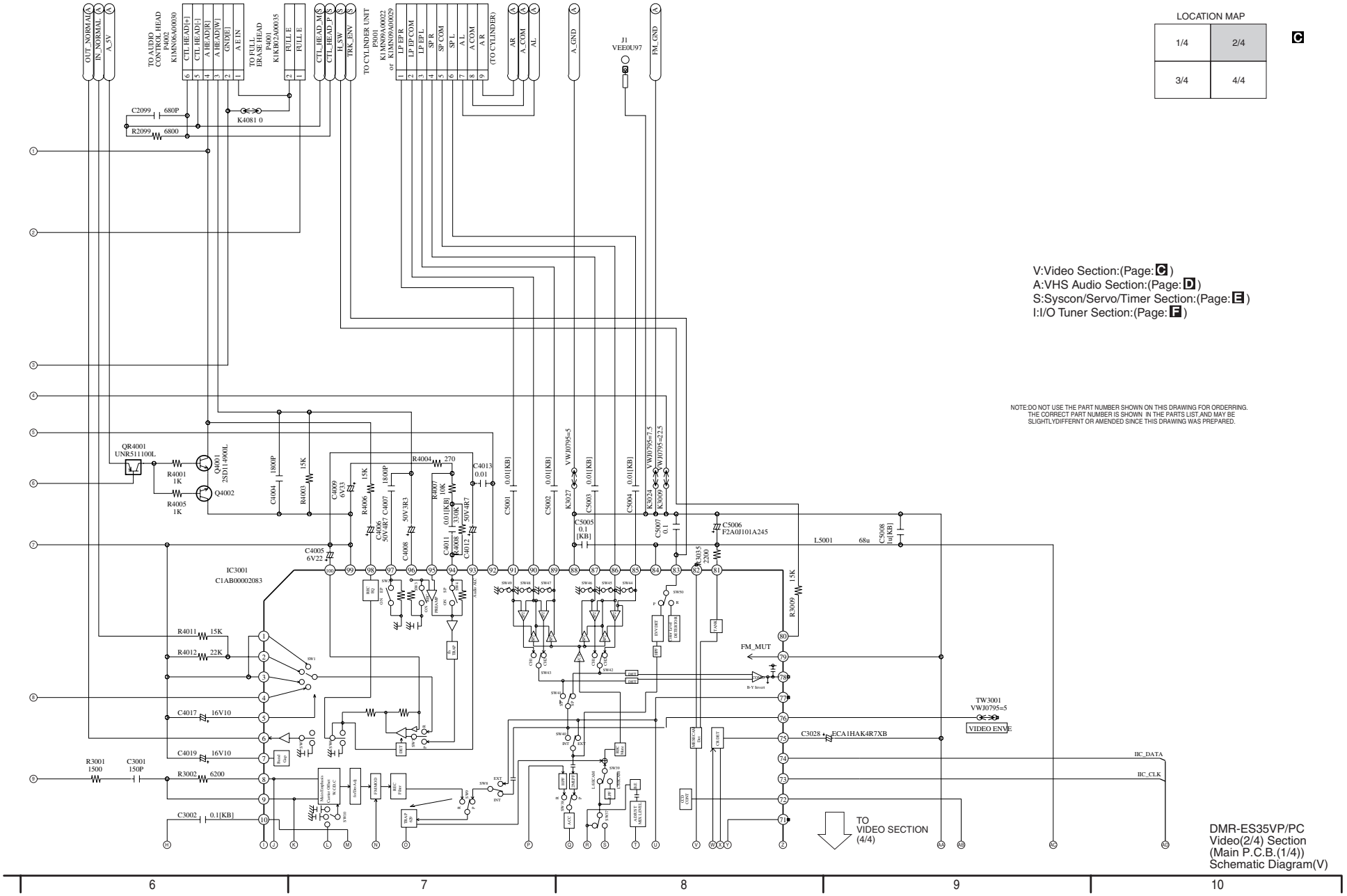
DMR-ES35VP/PC
Digital I/F(4/4) Section
(Power & Digital I/F P.C.B.(2/2))
Schematic Diagram(IF)

6 7 8 9 10

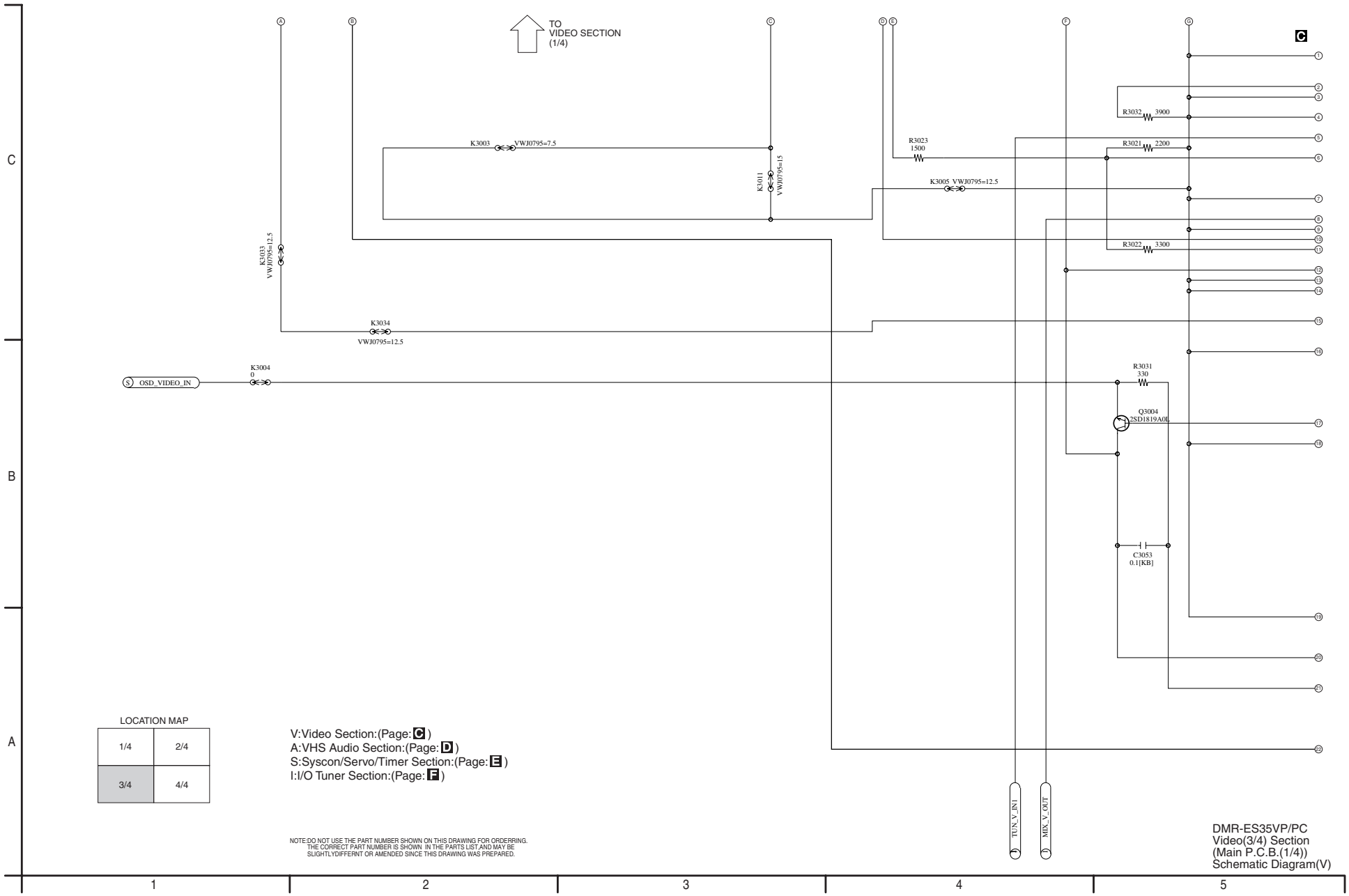
14.7. Video (1/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V)



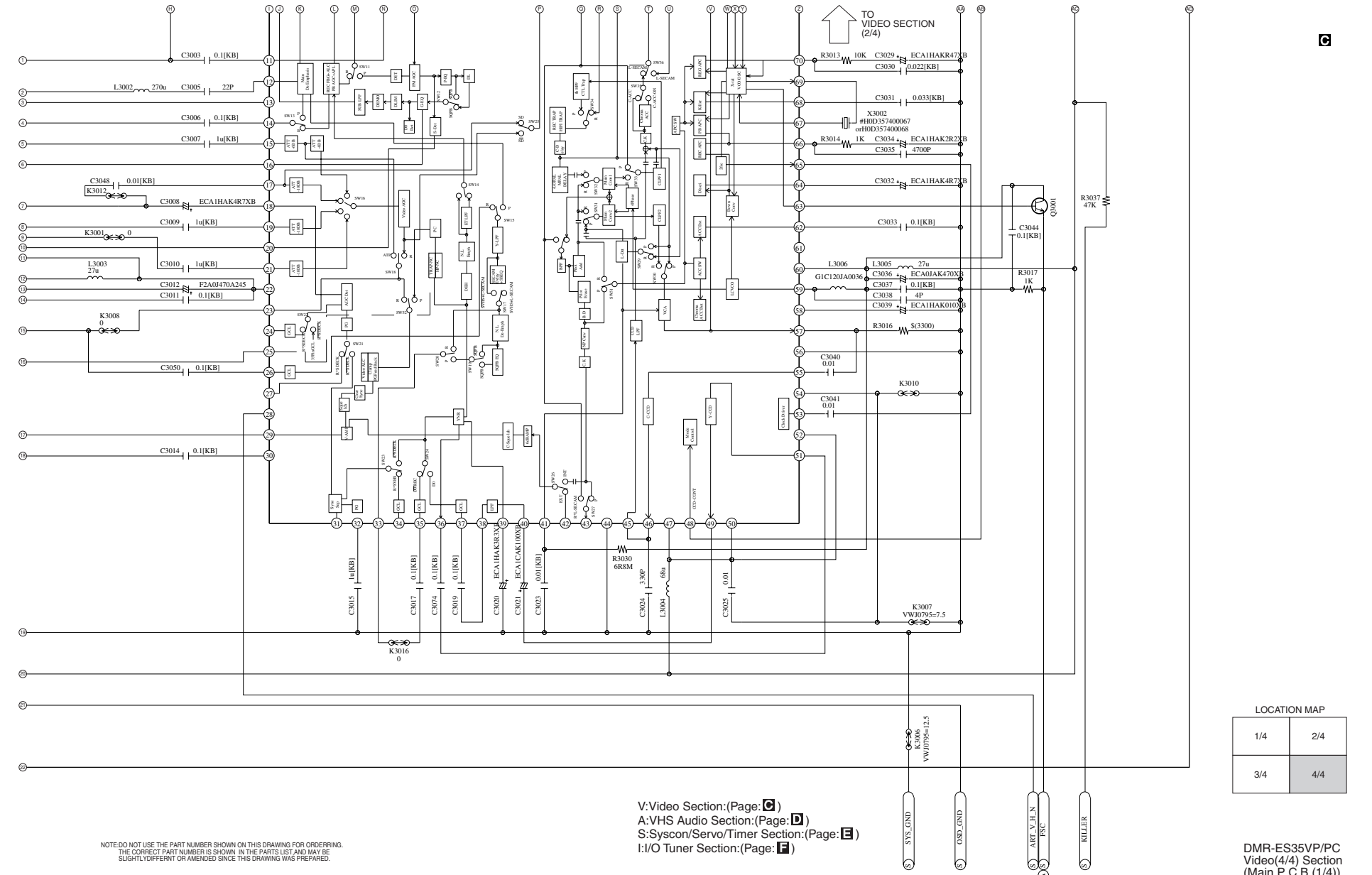
14.8. Video (2/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V)



14.9. Video (3/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V)



14.10. Video (4/4) Section (Main P.C.B.(1/4)) Schematic Diagram Schematic Diagram (V)



V:Video Section:(Page: C)
A:VHS Audio Section:(Page: D)
S:Syscon/Servo/Timer Section:(Page: E)
I:I/O Tuner Section:(Page: F)

LOCATION MAP

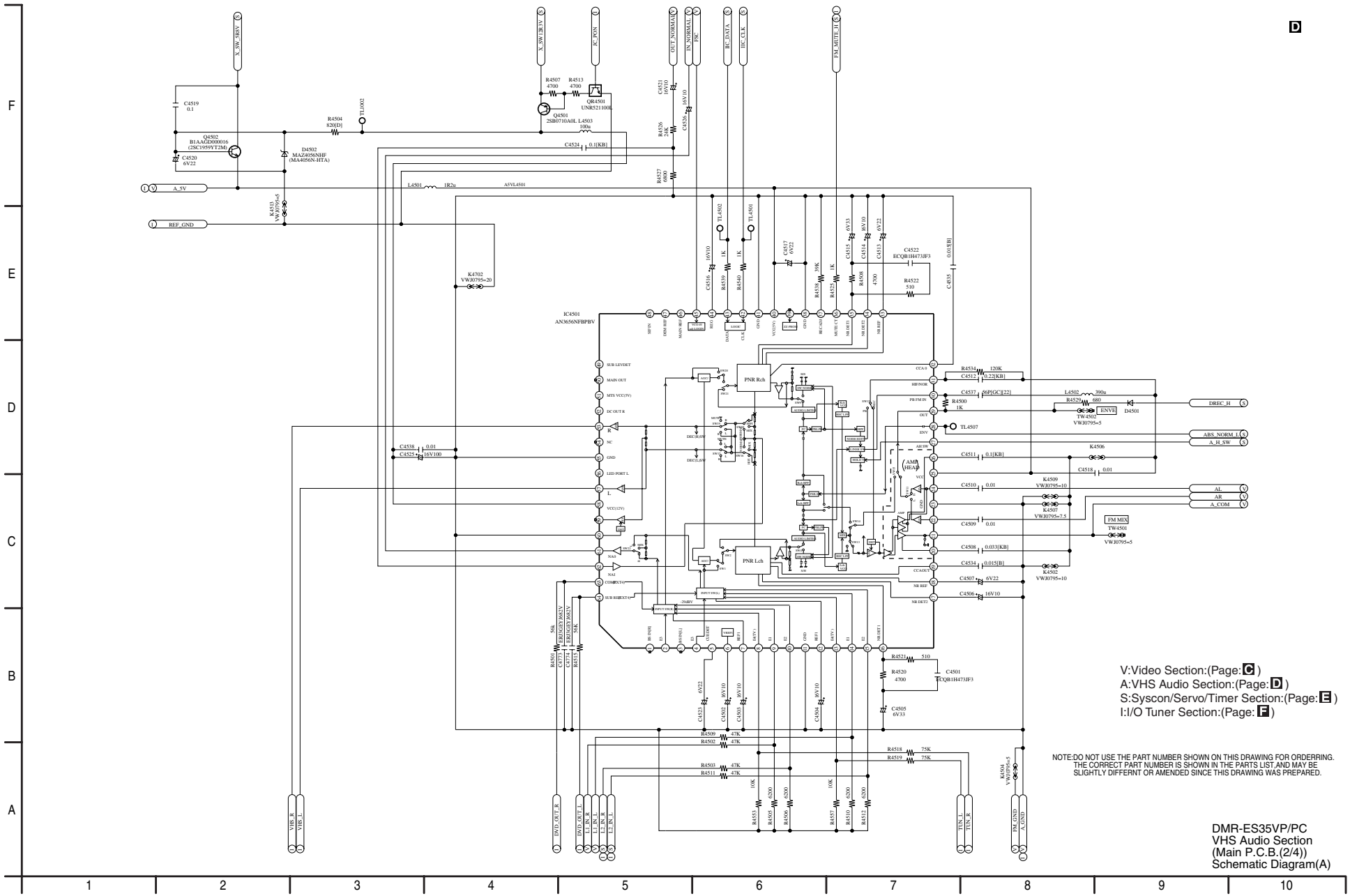
1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

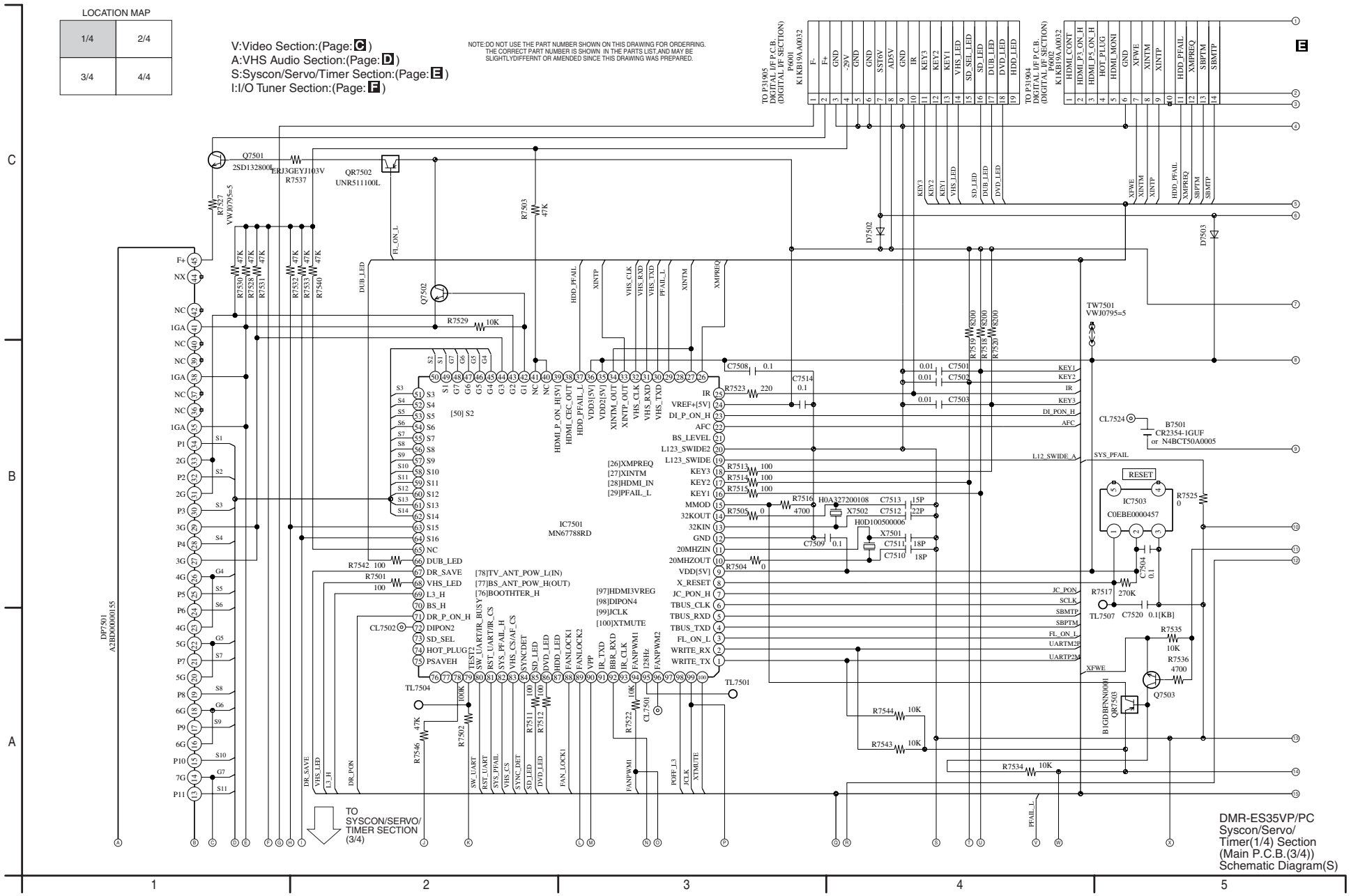
DMR-ES35VP/PC
Video(4/4) Section
(Main P.C.B.(1/4))
Schematic Diagram(V)

6 7 8 9 10

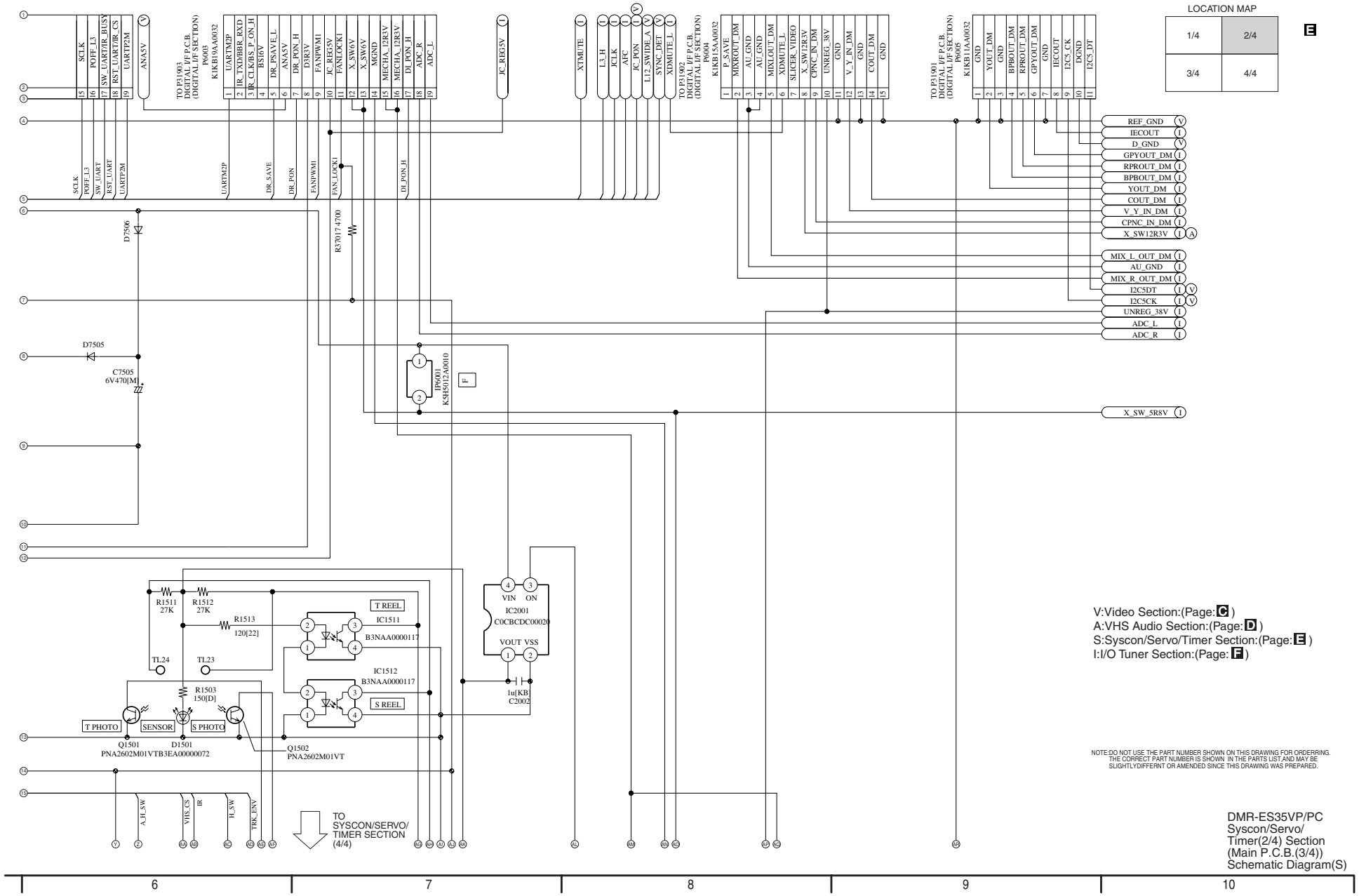
14.11. VHS Audio Section (Main P.C.B.(2/4)) Schematic Diagram (A)


D
IC4501
AN3656NFBPBV
PNR Rch
PNR Lch
V:Video Section:(Page:C)
A:VHS Audio Section:(Page:D)
S:Syscon/Servo/Timer Section:(Page:E)
I:I/O Tuner Section:(Page:F)
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.
DMR-ES35VP/PC
VHS Audio Section
(Main P.C.B.(2/4))
Schematic Diagram(A)

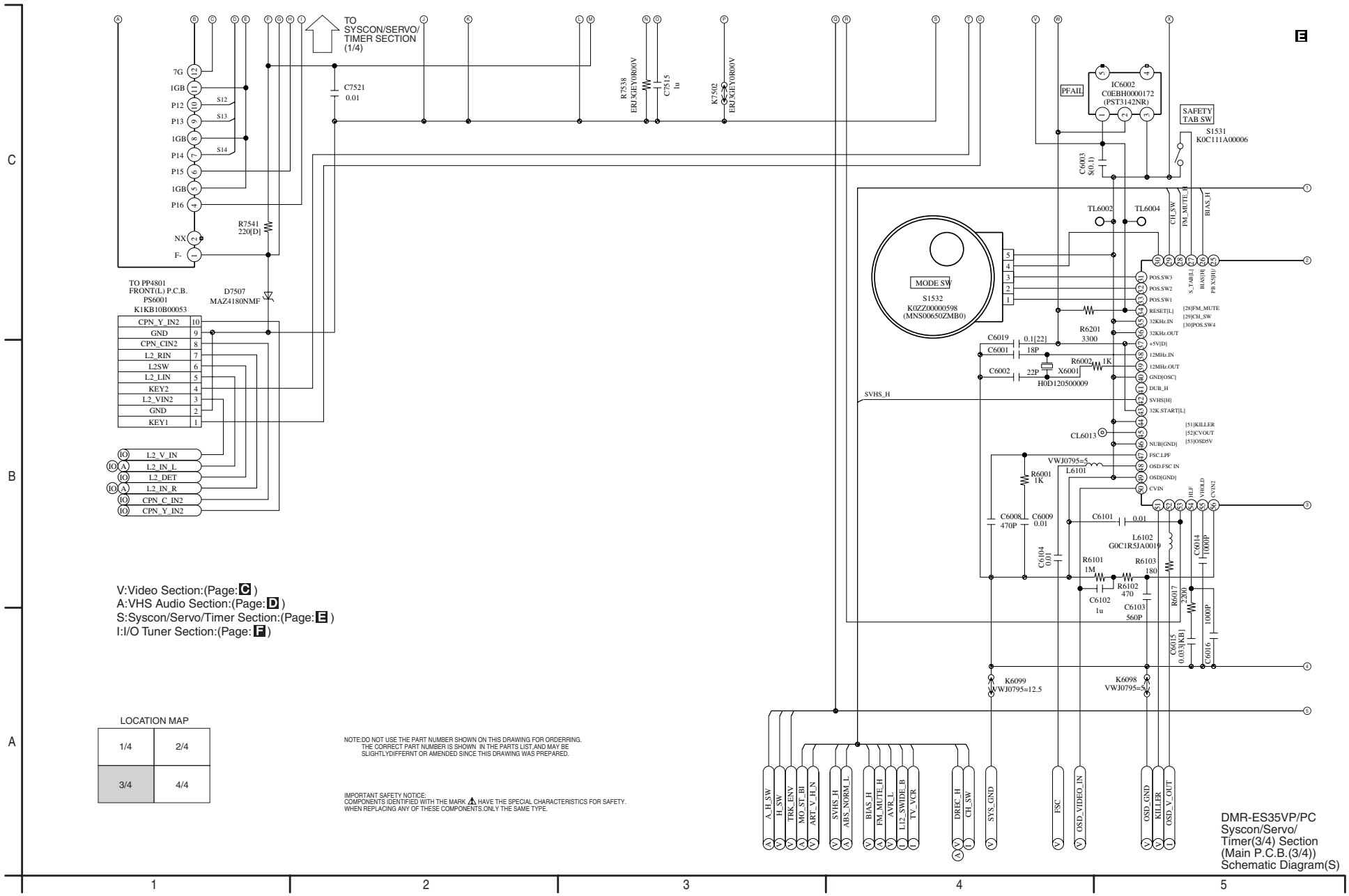
14.12. Syscon/Servo/Timer (1/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S)


LOCATION MAP
1/4
2/4
3/4
4/4
V:Video Section:(Page: C)
A:VHS Audio Section:(Page: D)
S:Syscon/Servo/Timer Section:(Page: E)
I:I/O Tuner Section:(Page: F)
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE SLIGHTLY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.
IC7501
MN67788RD
TO SYSCON/SERVO/ TIMER SECTION (3/4)
DMR-ES35VP/PC
Syscon/Servo/
Timer(1/4) Section
(Main P.C.B.(3/4))
Schematic Diagram(S)

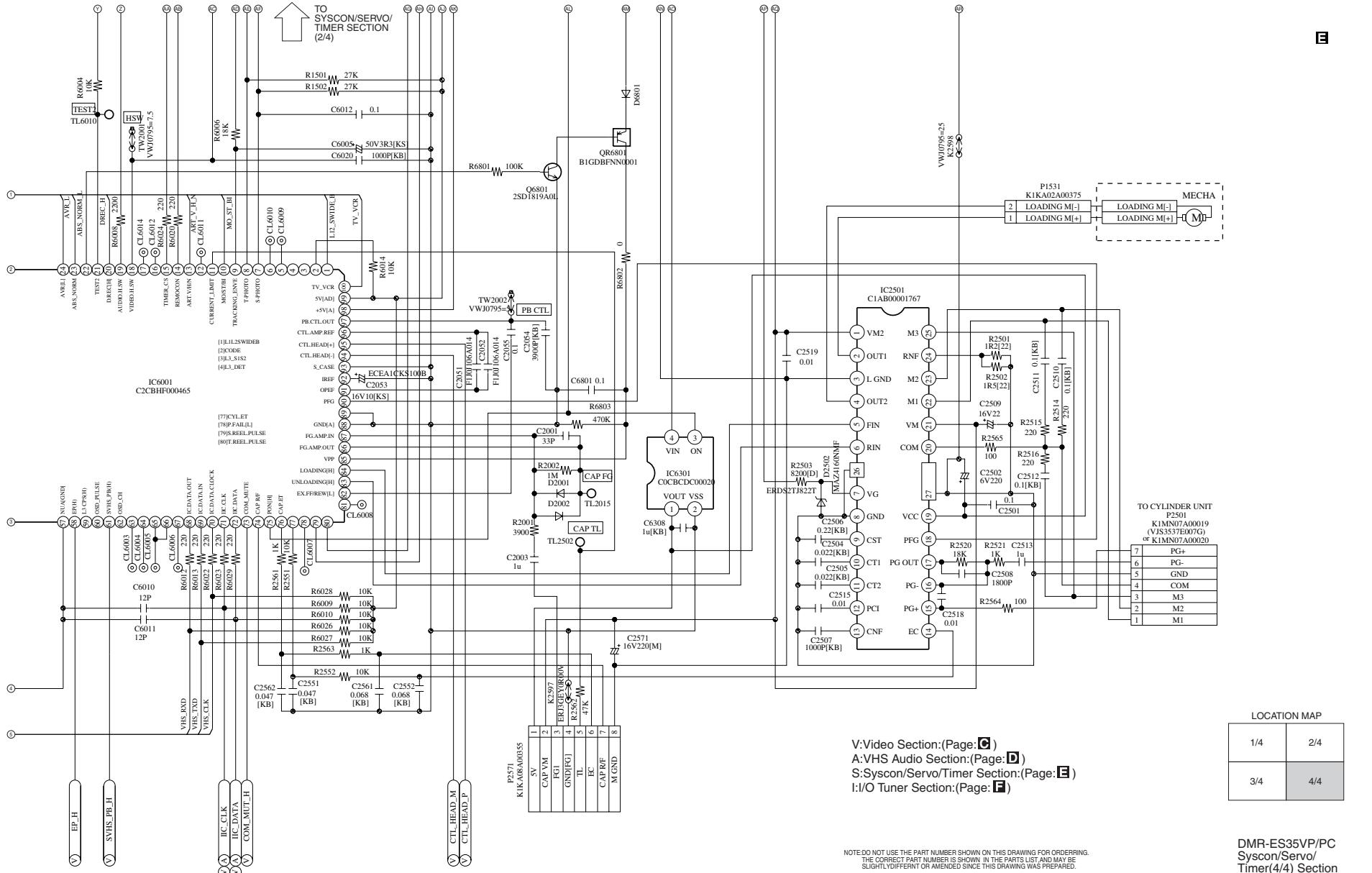
14.13. Syscon/Servo/Timer (2/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S)



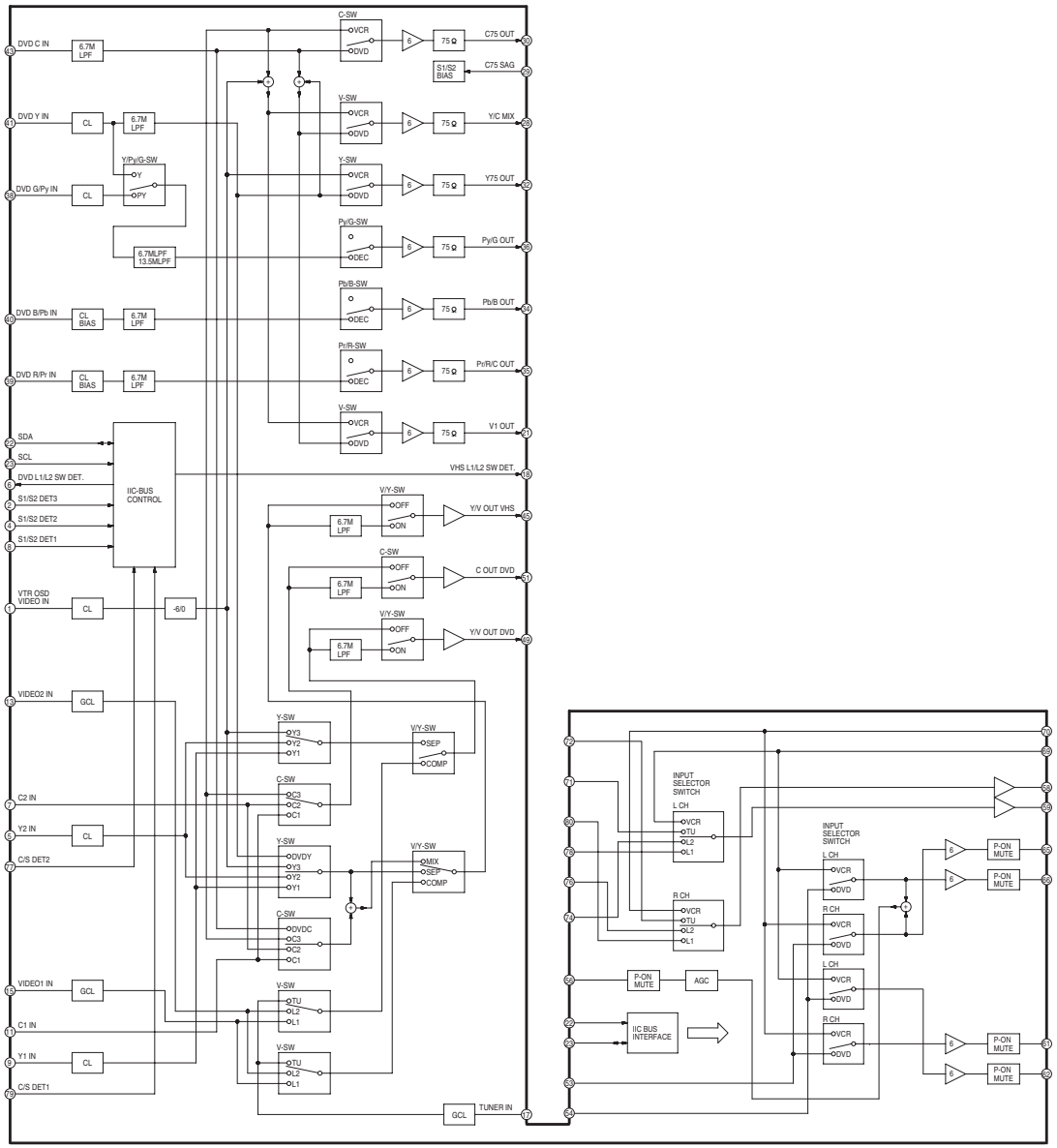
14.14. Syscon/Servo/Timer (3/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S)



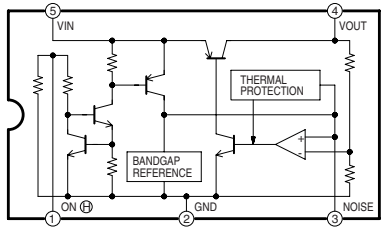
14.15. Syscon/Servo/Timer (4/4) Section (Main P.C.B.(3/4)) Schematic Diagram (S)



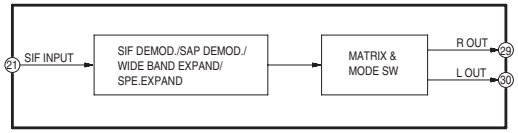
IC3701
VIDEO/AUDIO PROCESSOR
IC-DETAIL BLOCK DIAGRAM



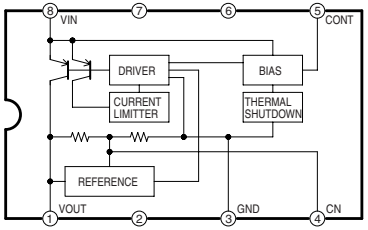
IC4801
AU +9V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



IC7301
AUDIO MULTIPLEX DECODER
IC-DETAIL BLOCK DIAGRAM

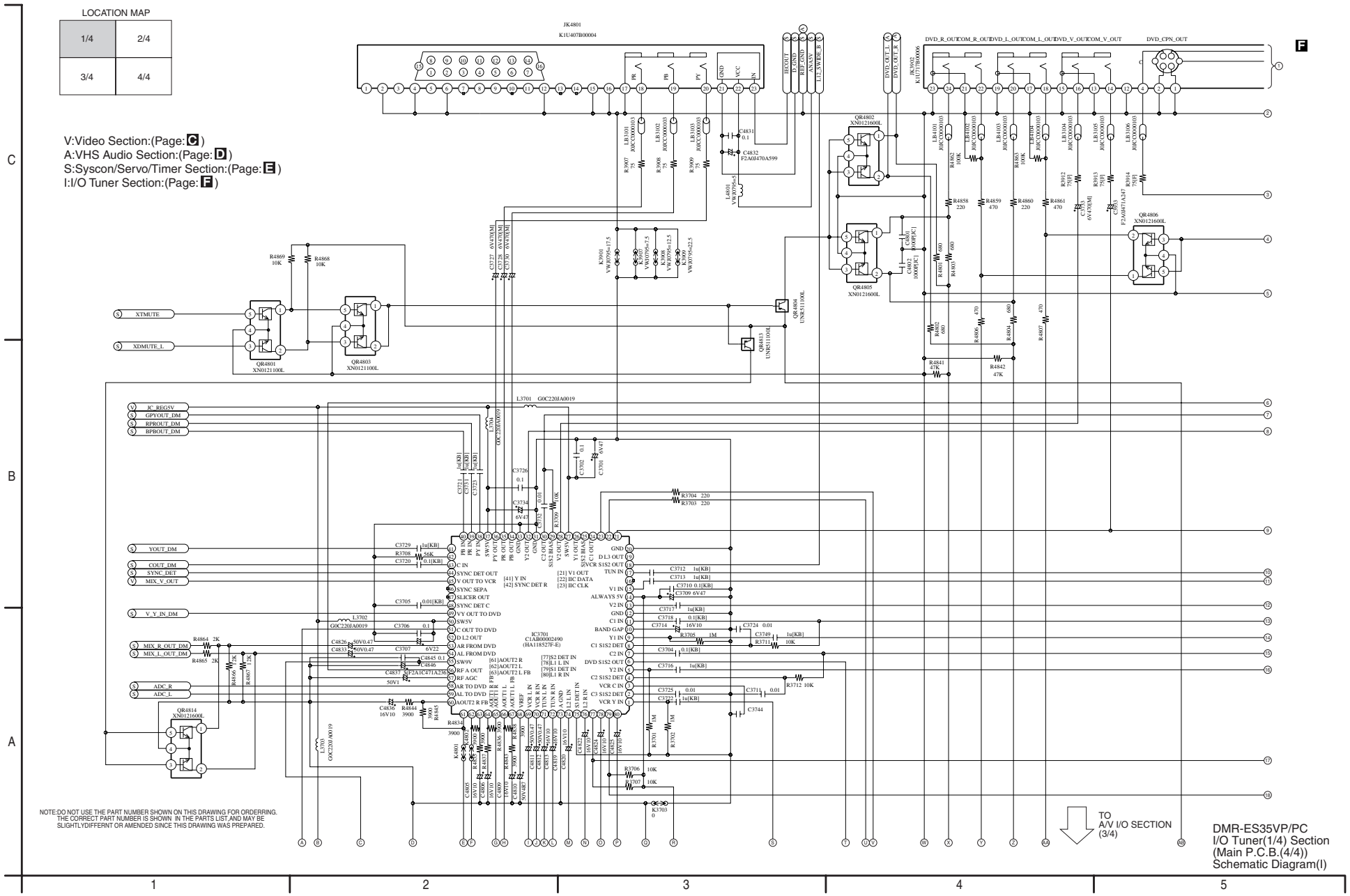


IC7402
TU +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM

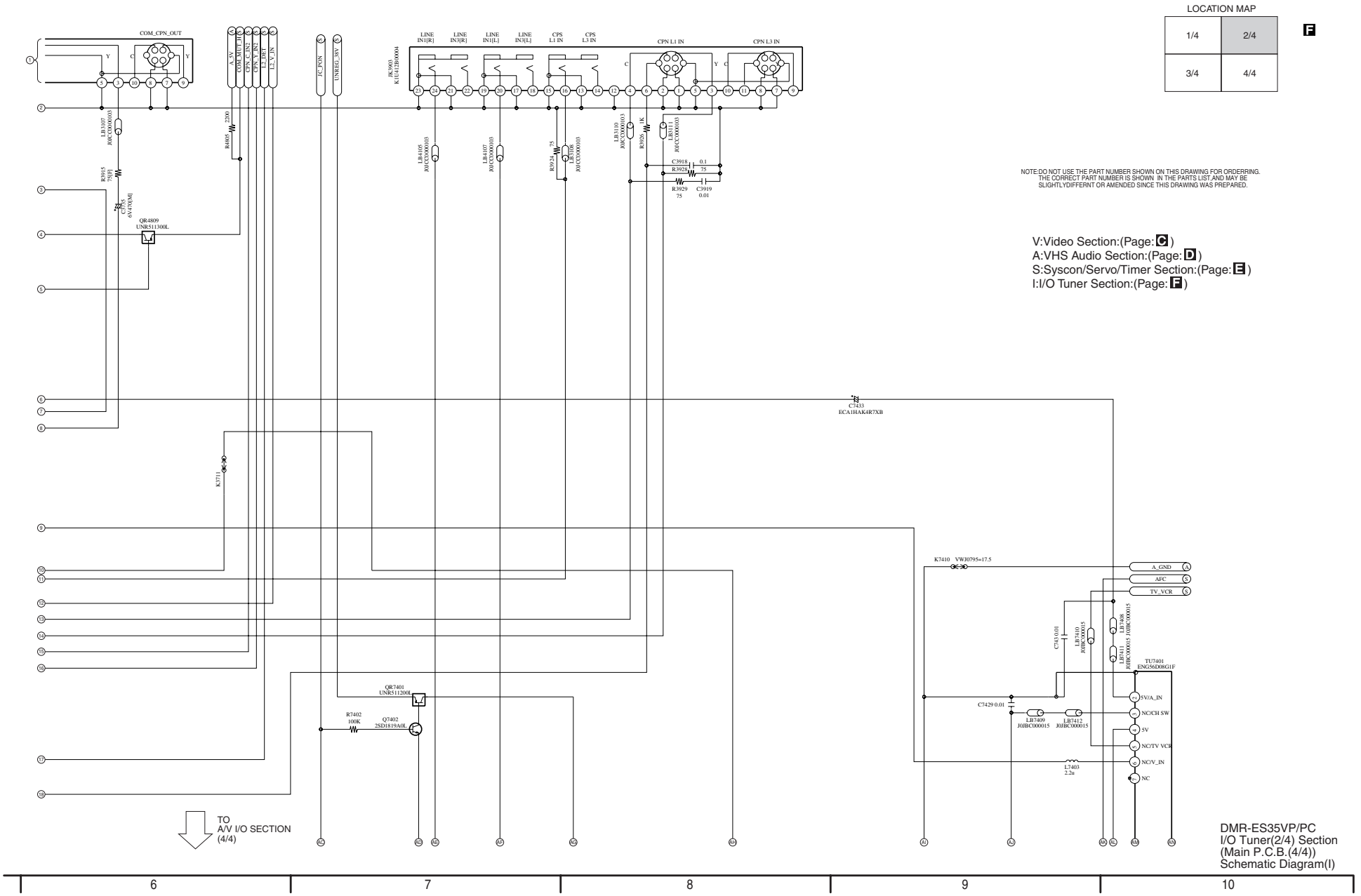


IC3701 Detail Block Diagram
IC4801 Detail Block Diagram
IC7301 Detail Block Diagram
IC7402 Detail Block Diagram
DMR-ES35VP/PC IC-Detail Block Diagram

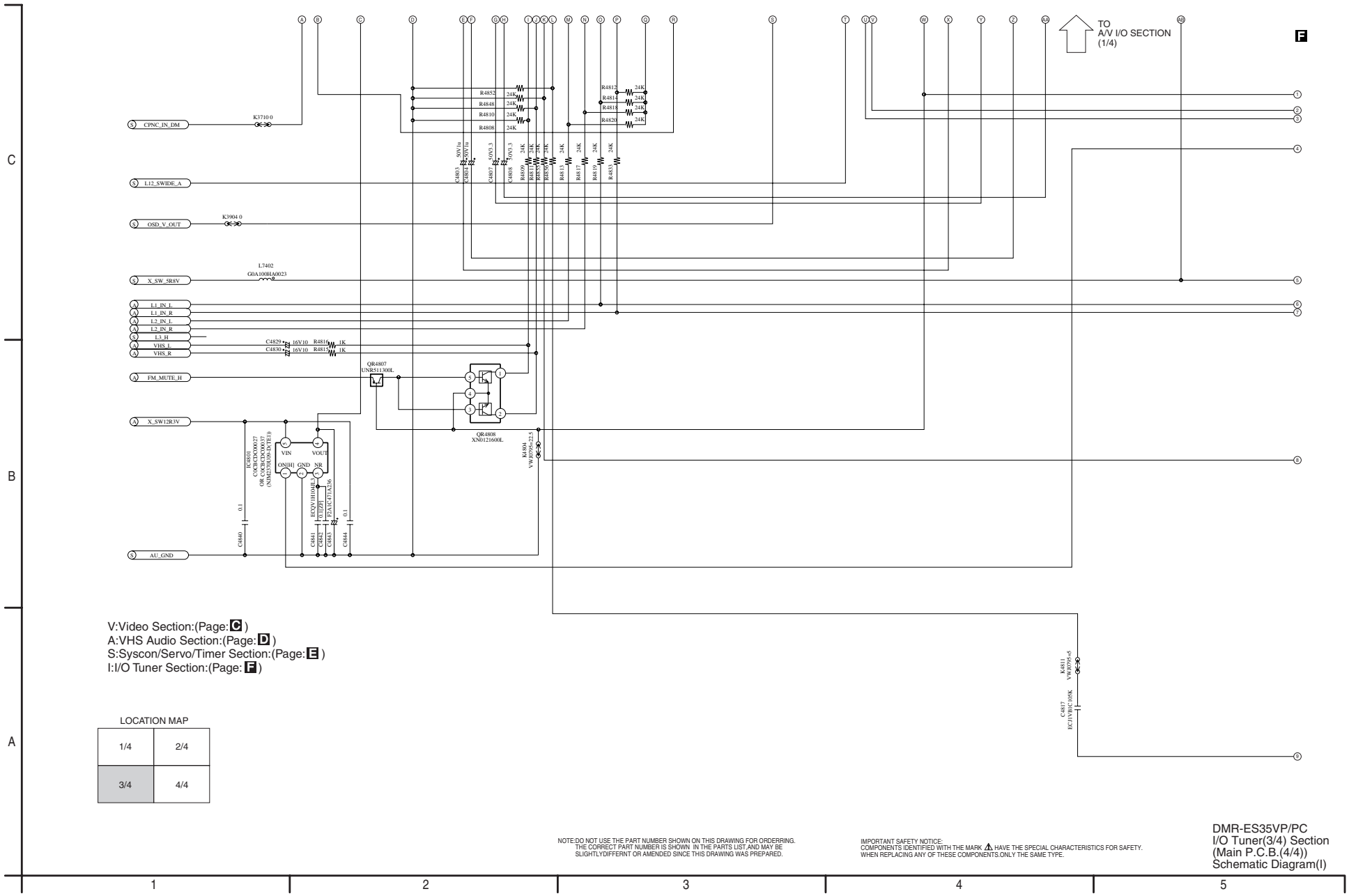
14.16. I/O Tuner Section (1/4) (Main P.C.B.(4/4)) Schematic Diagram (I)



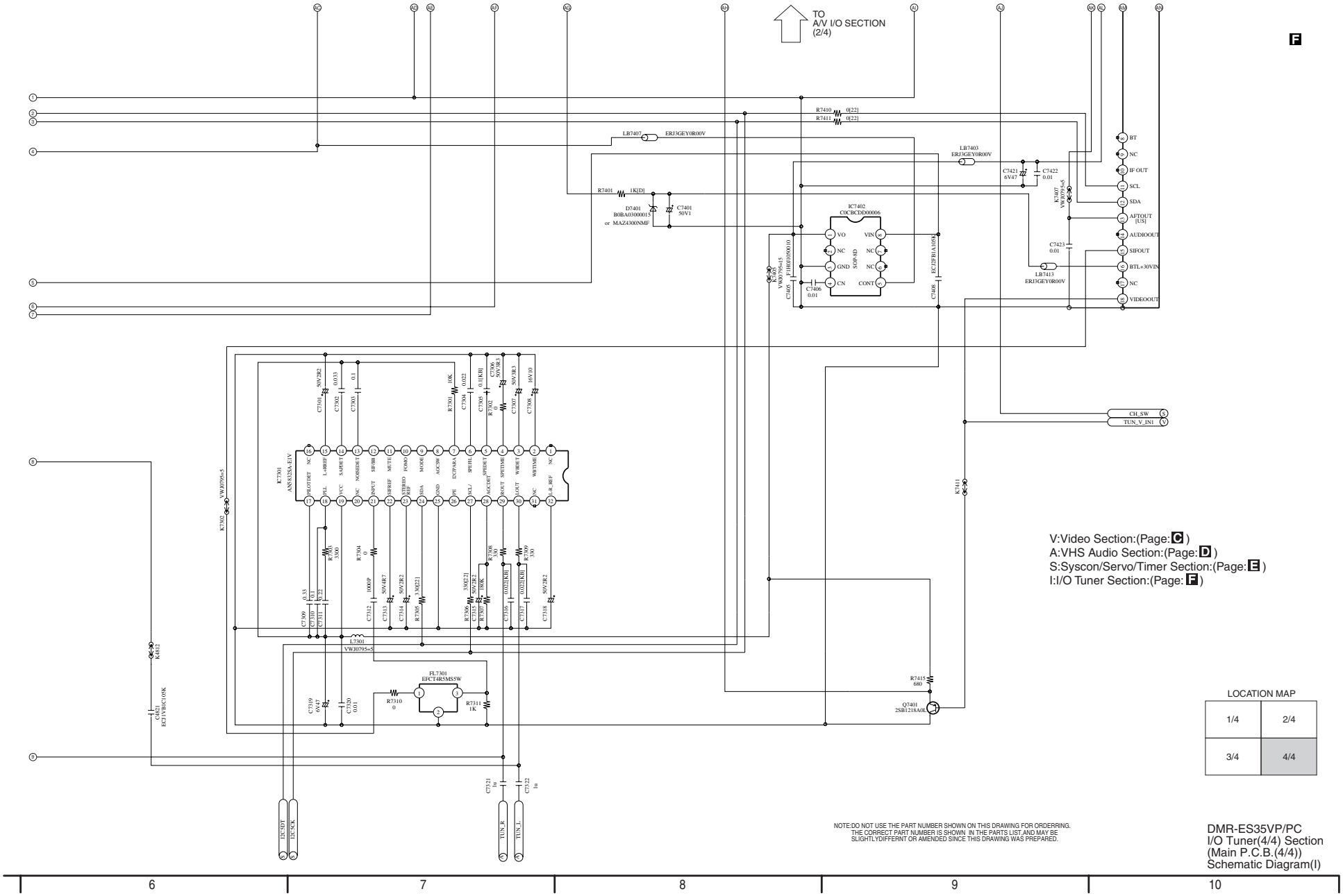
14.17. I/O Tuner Section (2/4) (Main P.C.B.(4/4)) Schematic Diagram (I)



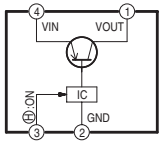
14.18. I/O Tuner Section (3/4) (Main P.C.B.(4/4)) Schematic Diagram (I)



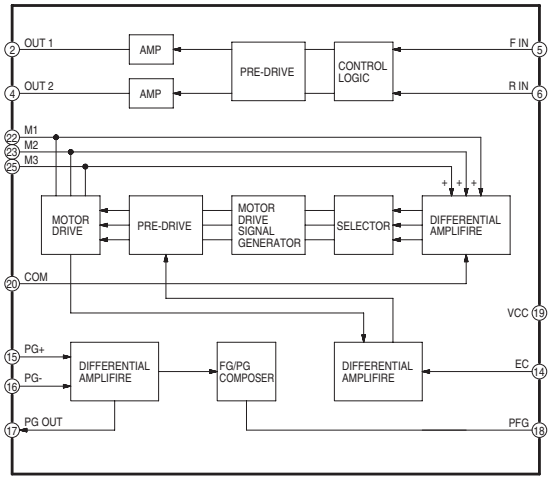
14.19. I/O Tuner Section (4/4) (Main P.C.B.(4/4)) Schematic Diagram (I)



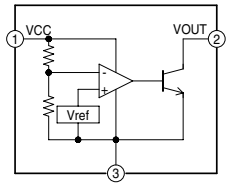
IC2001,6301
+5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



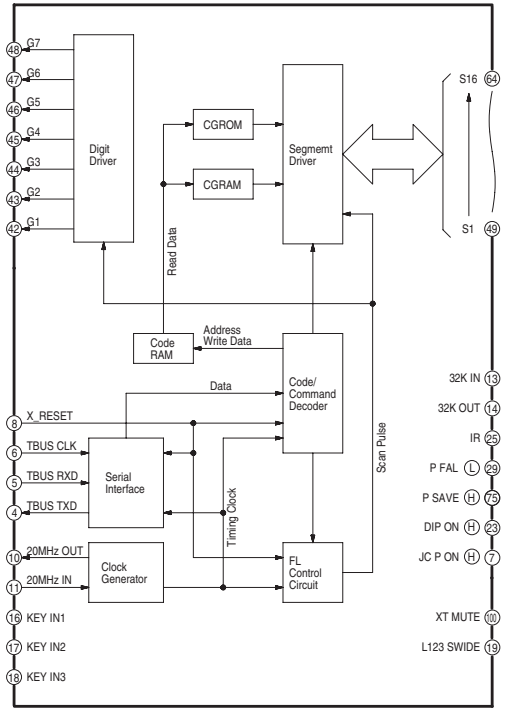
IC2501
LOADING/CYLINDER MOTOR DRIVE
IC-DETAIL BLOCK DIAGRAM



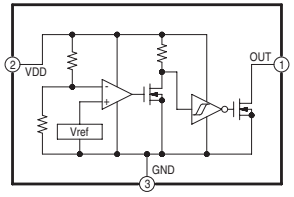
IC6002
RESET
IC-DETAIL BLOCK DIAGRAM



IC7501
TIMER
IC-DETAIL BLOCK DIAGRAM

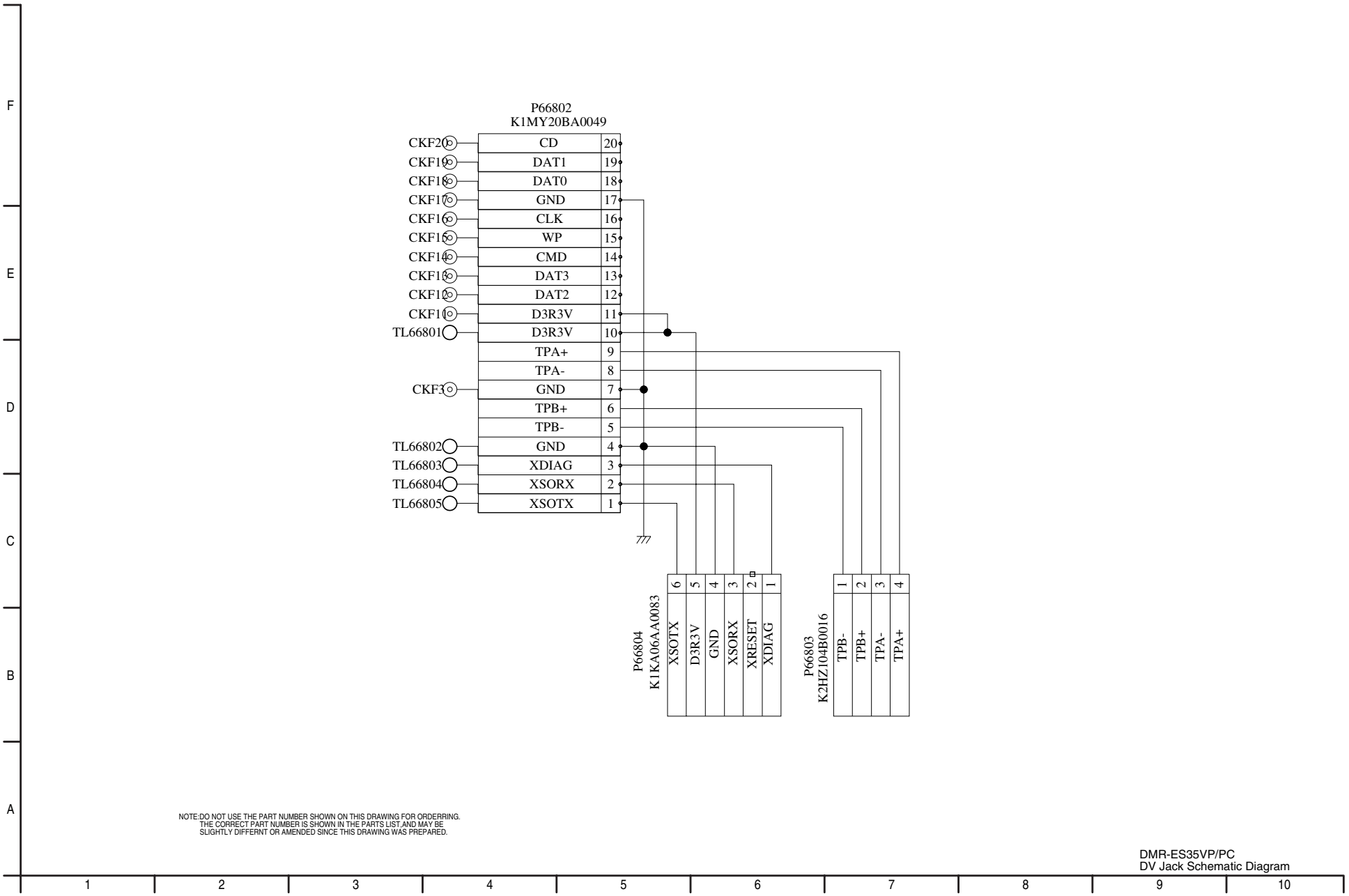


IC7503
RESET
IC-DETAIL BLOCK DIAGRAM

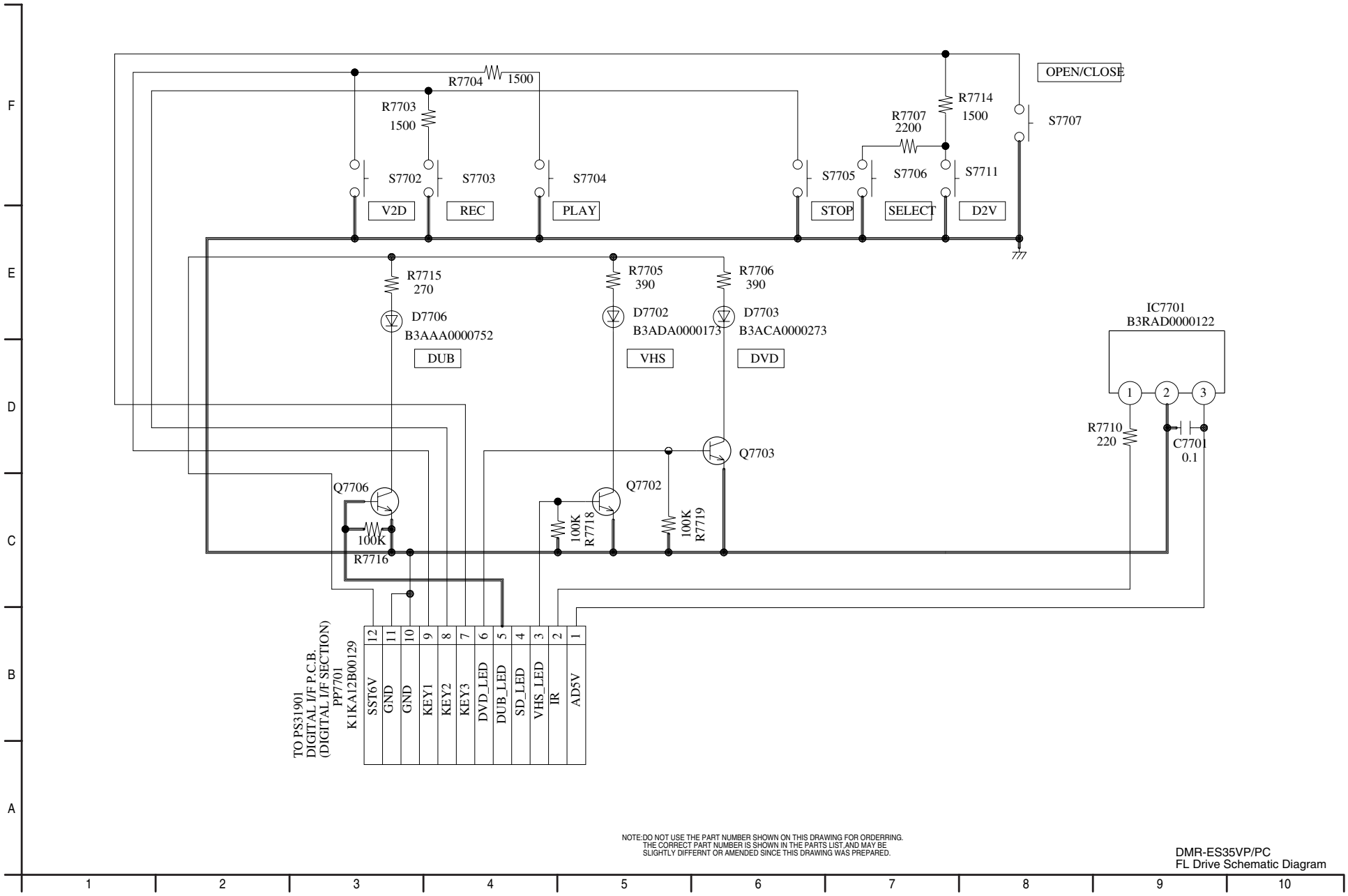


IC2001 Detail Block Diagram
IC2501 Detail Block Diagram
IC6002 Detail Block Diagram
IC6301 Detail Block Diagram
IC7501 Detail Block Diagram
IC7503 Detail Block Diagram
DMR-ES35VP/PC IC-Detail Block Diagram

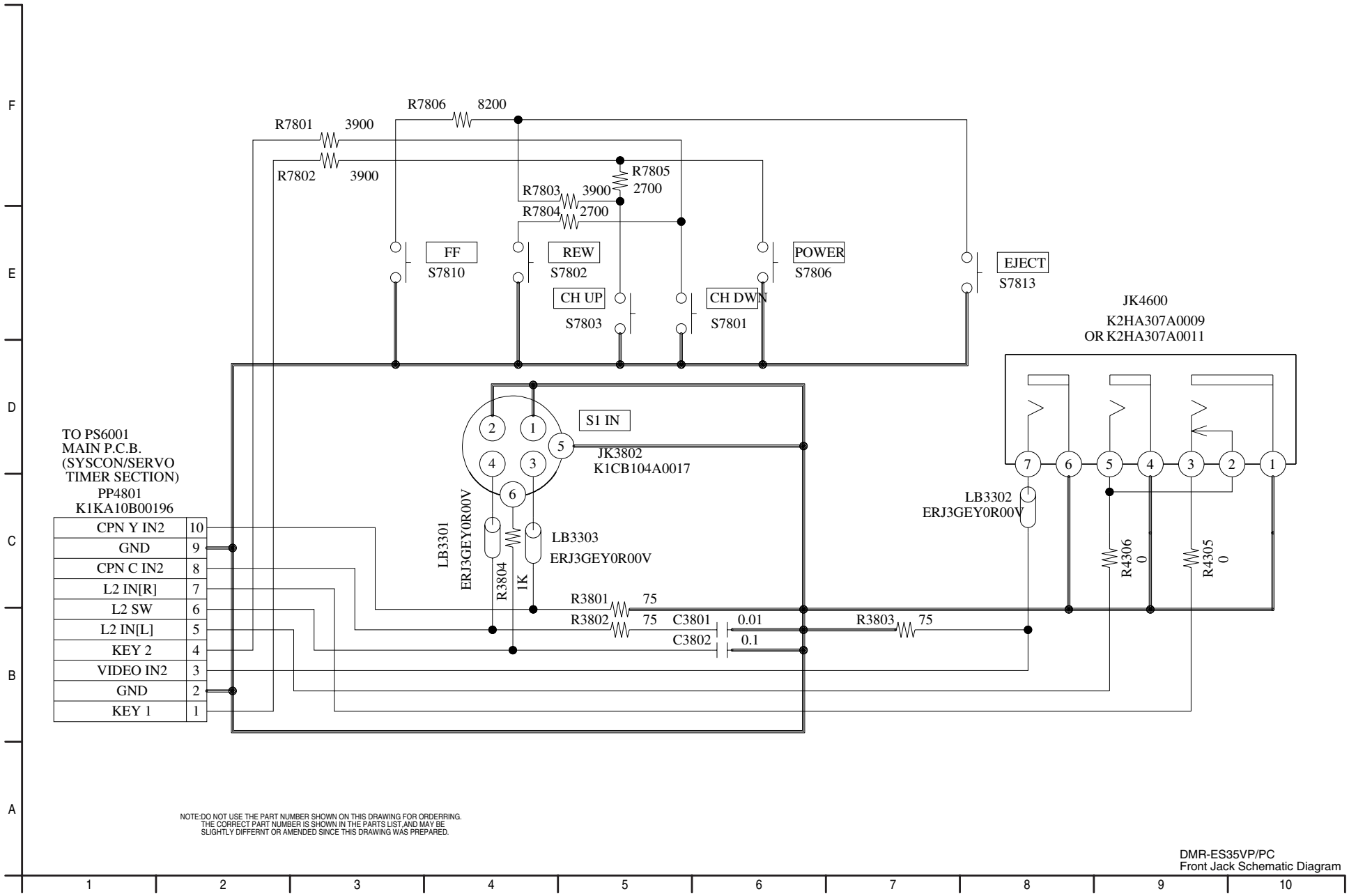
14.20. DV Jack Schematic Diagram



14.21. FL Drive Schematic Diagram



14.22. Front Jack Schematic Diagram

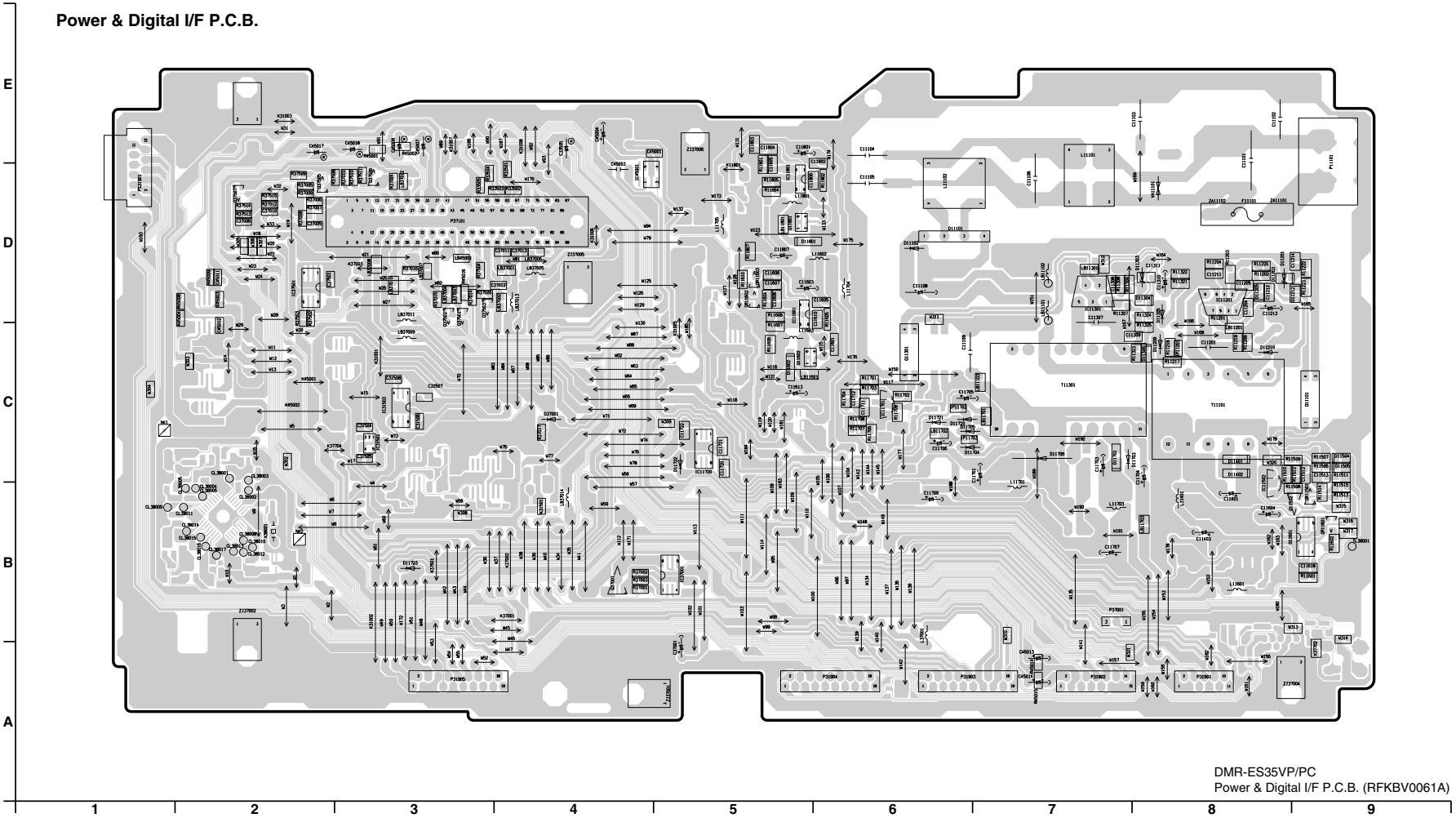


15 Printed Circuit Board

15.1. Power & Digital I/F P.C.B.

15.1.1. Power & Digital I/F P.C.B.

Power & Digital I/F P.C.B.



DMR-ES35VP/PC
Power & Digital I/F P.C.B. (RFKBV0061A)

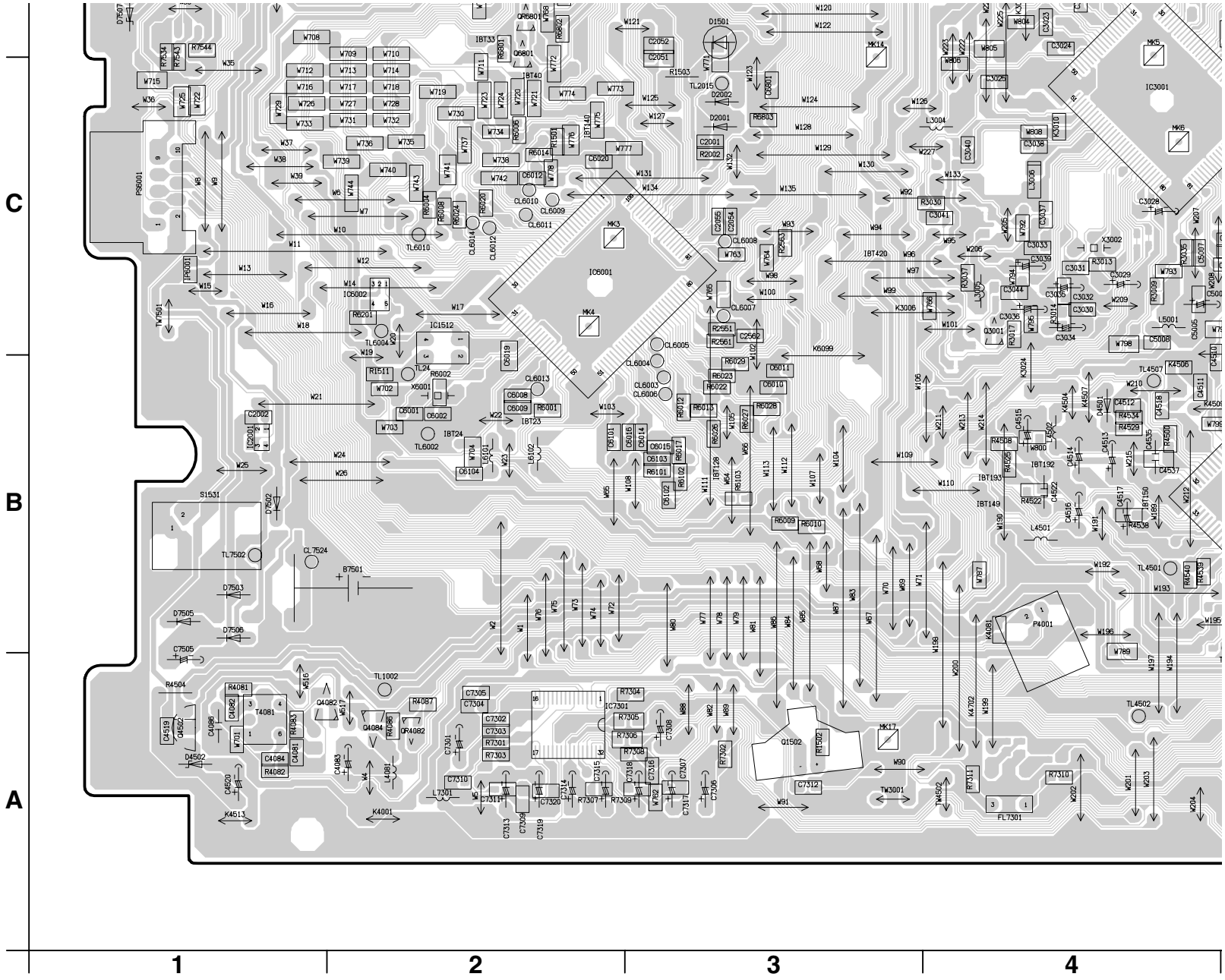
15.1.2. Power & Digital I/F P.C.B. Address Information

Digital I/F P.C.B.

Integrated Circuit	
IC11201	D-8
IC11301	D-7
IC11502	B-8
IC11601	D-5
IC11701	C-6
IC11720	C-5
IC11801	D-5
IC31501	C-3
IC31503	C-3
IC37001	B-5
IC37501	D-2
IC45001	D-4
Transistor	
Q11101	C-9
Q11301	C-6
Q11502	B-8
Q11601	B-8
Q11602	C-5
Q11801	D-5
Q37001	B-4
Q37501	D-3
Q37502	D-3
Q37503	D-3
Q37505	D-2
Q37506	D-3
Q37507	D-2
Transistor-resistor	
QR11501	B-9
QR11601	B-9
QR11602	D-5
QR11603	D-5
Test Point	
TL38001	B-9
Connector	
P11101	E-9
P31901	A-8
P31902	A-7
P31903	A-6
P31904	A-6
P31905	A-3
P35001	A-8
P37001	B-7
P37101	D-3
PS31901	D-1
Diode	
D11101	D-6
D11102	D-6
D11201	D-8
D11203	D-8
D11205	D-8
D11209	C-8
D11210	C-8
D11212	D-9
D11303	D-8
D11304	D-8
D11305	D-8
D11306	C-8
D11401	C-8
D11402	C-8
D11504	C-9
D11505	C-9
D11602	C-5
D11701	C-7
D11703	C-7
D11704	C-6
D11705	C-6
D11706	C-7
D11720	C-6
D11721	C-6
D11722	C-5
D11723	B-3
D11801	D-5
D37001	C-4
Fuse	
F11101	D-8
IC Protector	
IP11201	C-8
IP11702	C-6
IP11703	C-6
Coil	
L11101	E-7
L11102	D-6
L11401	B-8
L11601	B-8
L11602	D-6
L11603	C-5
L11701	B-7
L11703	B-7
L11704	D-6
L11801	D-5
LB11101	D-7
LB11102	D-7
LB11103	C-7
LB11201	C-8
LB11301	D-7
LB11601	C-5
LB11701	C-7
LB11702	C-6
LB11703	B-8
LB11801	D-5
LB37001	D-4
LB37002	D-4
LB37003	D-3
LB37004	D-3
LB37005	D-4
LB37006	D-4
LB37007	D-3
LB37008	D-3
LB37009	C-3
LB37010	D-3
LB37011	D-3
LB37012	D-3
LB37013	D-4
LB37014	B-4
LB45001	D-3
Transformer	
T11101	C-8
T11301	C-7
Surge Absorber	
VA11101	D-8
Fuse Holder	
ZA11101	D-8
ZA11102	D-8
Capacitor	
C11101	E-8
C11102	E-8
C11103	E-8
C11104	E-6
C11105	D-6
C11106	D-7
C11108	D-6
C11109	C-6
C11201	C-8
C11204	D-8
C11205	D-8
C11211	D-8
C11212	D-8
C11213	D-8
C11214	D-9
C11307	C-7
C11308	D-7
C11309	C-8
C11310	D-8
C11311	D-8
C11401	B-8
C11403	B-8
C11512	C-9
C11513	C-9
C11601	C-6
C11603	D-5
C11604	B-8
C11605	D-6
C11606	D-5
C11607	D-5
C11608	D-5
C11610	C-5
C11613	C-5
C11618	B-9
C11701	C-7
C11703	C-7
C11704	C-8
C11705	C-6
C11706	C-6
C11707	B-7
C11709	B-6
C11711	C-6
C11712	C-6
C11720	C-5
C11721	C-5
C11722	C-5
C11801	E-5
C11802	E-5
C11803	E-5
C11804	E-5
C11805	D-5
C11806	D-5
C11807	D-5
C31504	C-3
C31505	C-3
C31506	C-3
C31507	C-3
C31508	C-3
C33505	E-4
C35001	D-5
C37001	A-5
C37005	D-2
C37006	D-2
C37010	D-2
C37011	D-4
C37012	D-4
C37013	D-4
C37501	D-2
C45001	E-4
C45003	D-4
C45004	E-4
C45007	E-3
C45008	E-3
C45011	D-2
C45012	C-2
C45013	A-7
C45014	A-7
C45017	E-2
C45018	E-3
Resistor	
R11201	C-8
R11202	D-8
R11203	D-8
R11204	D-8
R11208	C-8
R11217	C-8
R11218	C-8
R11219	C-8
R11220	D-8
R11222	D-9
R11223	D-9
R11307	D-7
R11308	D-7
R11309	D-7
R11321	D-8
R11322	D-8
R11323	C-8
R11324	C-8
R11325	C-8
R11506	C-9
R11507	C-9
R11508	B-9
R11509	C-9
R11510	C-8
R11511	B-9
R11512	C-9
R11513	B-9
R11514	B-9
R11515	B-9
R11601	B-9
R11602	B-9
R11604	D-5
R11605	D-6
R11606	C-5
R11607	C-5
R11608	D-5
R11610	D-5
R11701	C-6
R11702	C-6
R11703	C-6
R11704	C-6
R11706	C-6
R11707	C-6
R11708	C-6
R11709	C-6
R11801	D-5
R11802	D-6
R11803	D-5
R11804	D-5
R11805	D-5
R11807	D-5
R33501	D-4
R33502	D-4
R33503	D-4
R33504	D-3
R33505	D-3
R37001	B-4
R37002	B-4
R37003	B-4
R37004	D-3
R37005	D-2
R37006	D-2
R37007	D-2
R37008	D-2
R37009	D-2
R37010	D-3
R37012	D-2
R37014	D-3
R37015	D-3
R37016	D-3
R37017	C-4
R37502	D-2
R37503	D-2
R37504	D-3
R37505	D-3
R37508	D-3
R37509	D-2
R37510	D-3
R37511	D-3
R37513	D-2
R37514	D-2
R37515	D-2
R45001	E-3
R45002	E-3
R45008	D-2
R45009	D-2
R45014	A-7
R45015	A-7
R45016	D-3

15.2. Main P.C.B.

15.2.1. Main P.C.B. (1/4 Section)



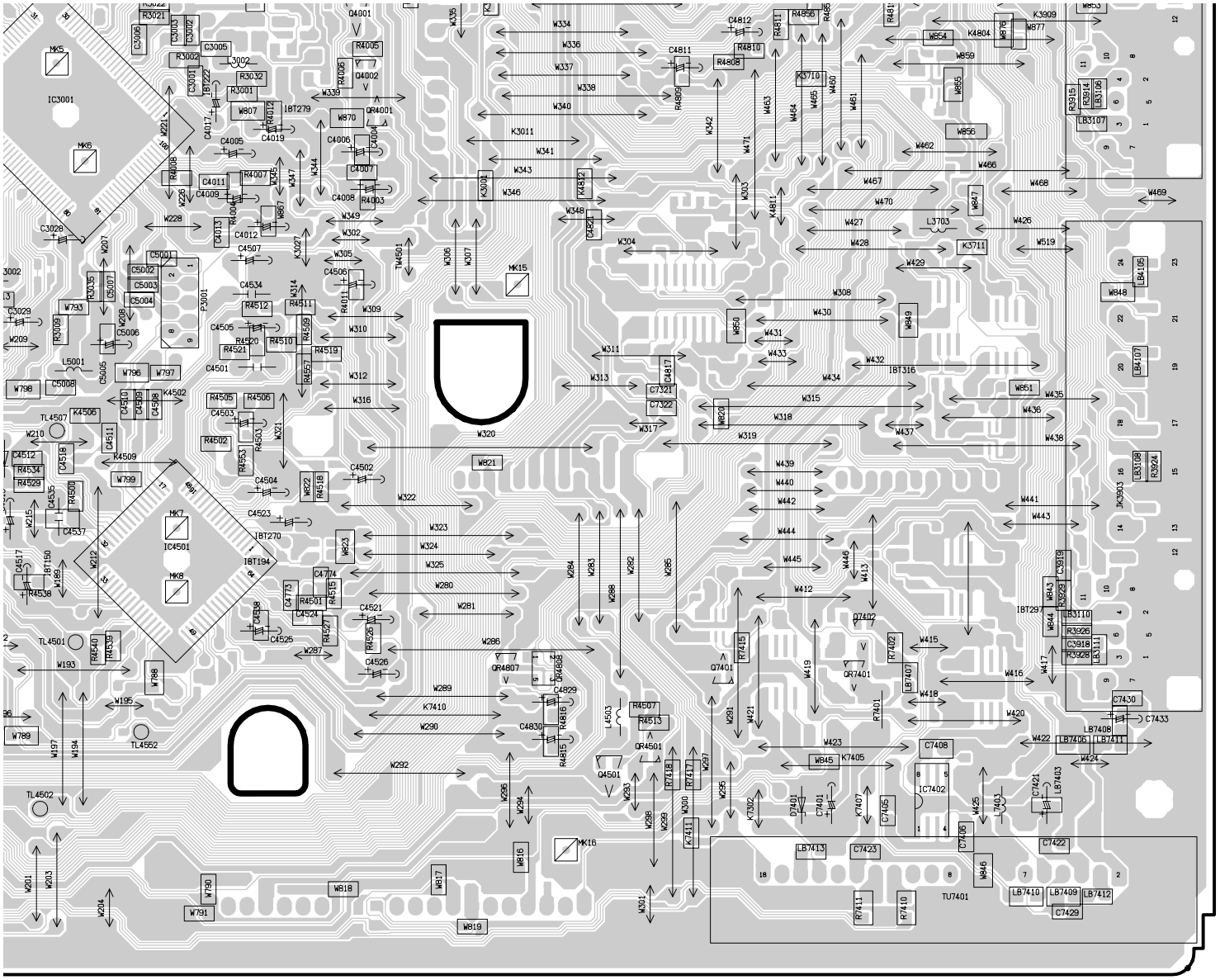
Location Map

(FRONT) (REAR)

3/4	4/4
1/4	2/4

DMR-ES35VP/PC
Main P.C.B. (VEPV0054BT)
(1/4 Section)

15.2.2. Main P.C.B. (2/4 Section)



Location Map

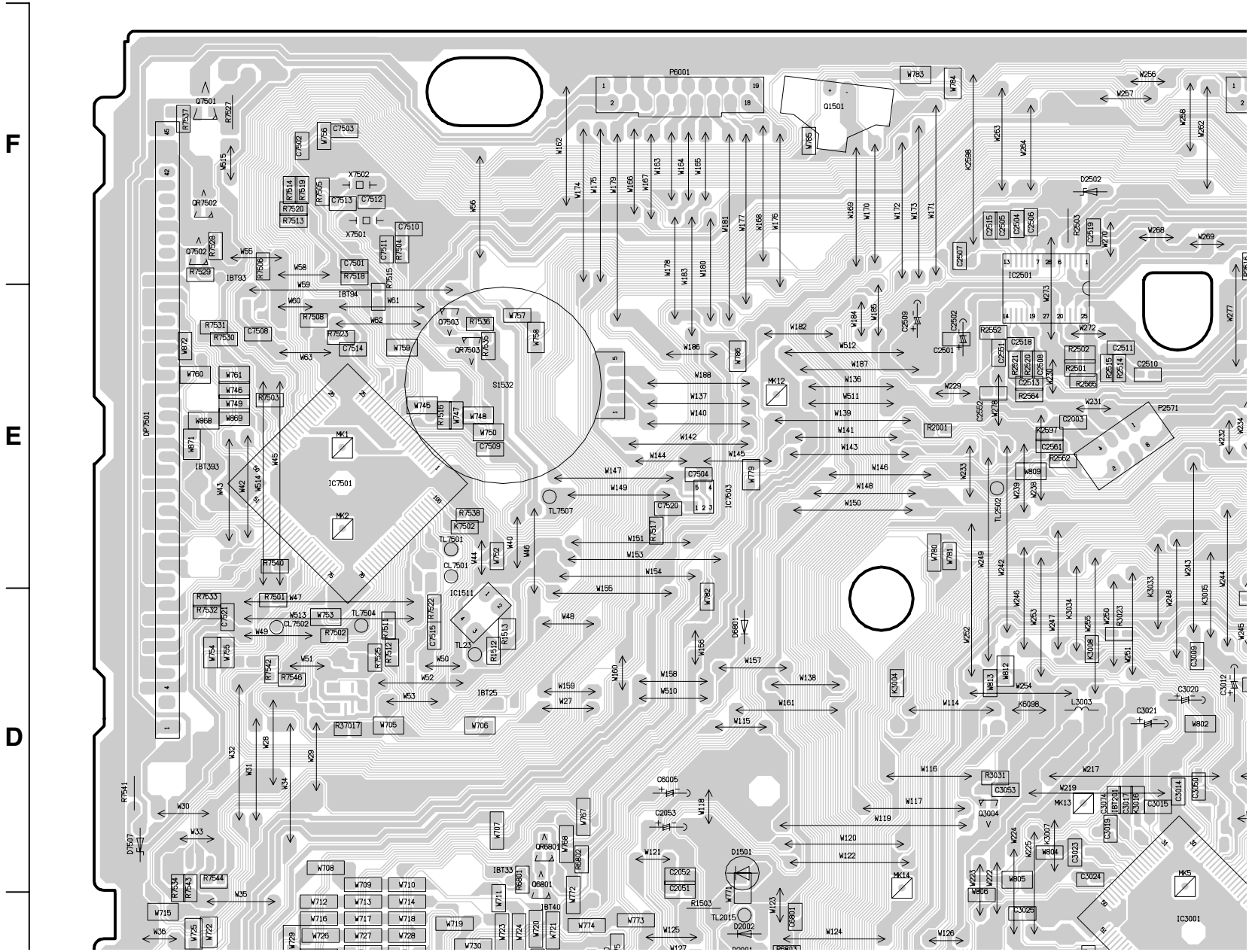
(FRONT) (REAR)

3/4	4/4
1/4	2/4

DMR-ES35VP/PC
Main P.C.B. (VEPV0054BT)
(2/4 Section)

5 6 7 8

15.2.3. Main P.C.B. (3/4 Section)



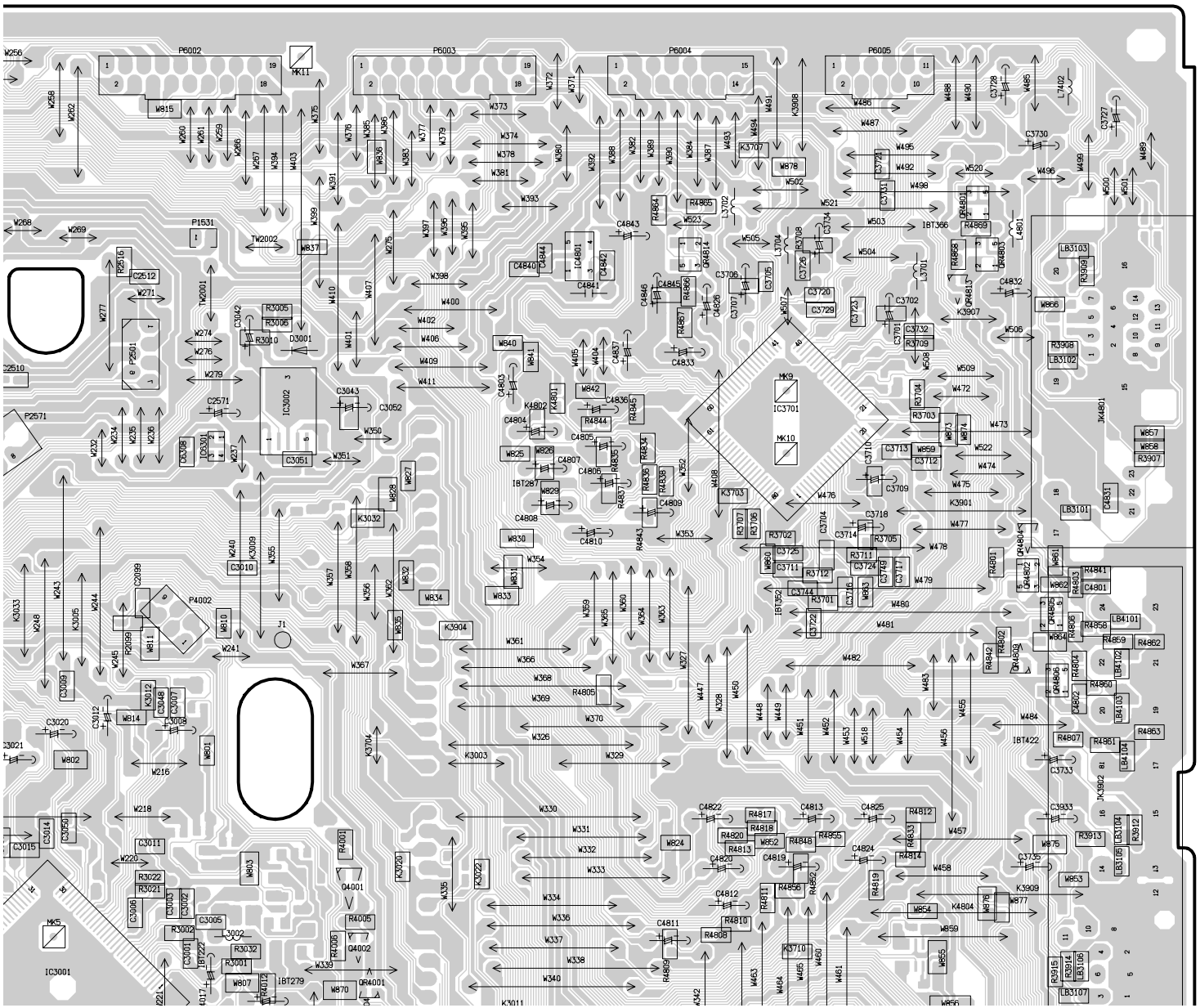
Location Map

(FRONT) (REAR)

3/4	4/4
1/4	2/4

DMR-ES35VP/PC
Main P.C.B. (VEPV0054BT)
(3/4 Section)

15.2.4. Main P.C.B. (4/4 Section)



Location Map

(FRONT) (REAR)

3/4	4/4
1/4	2/4

DMR-ES35VP/PC
Main P.C.B. (VEPV0054BT)
(4/4 Section)

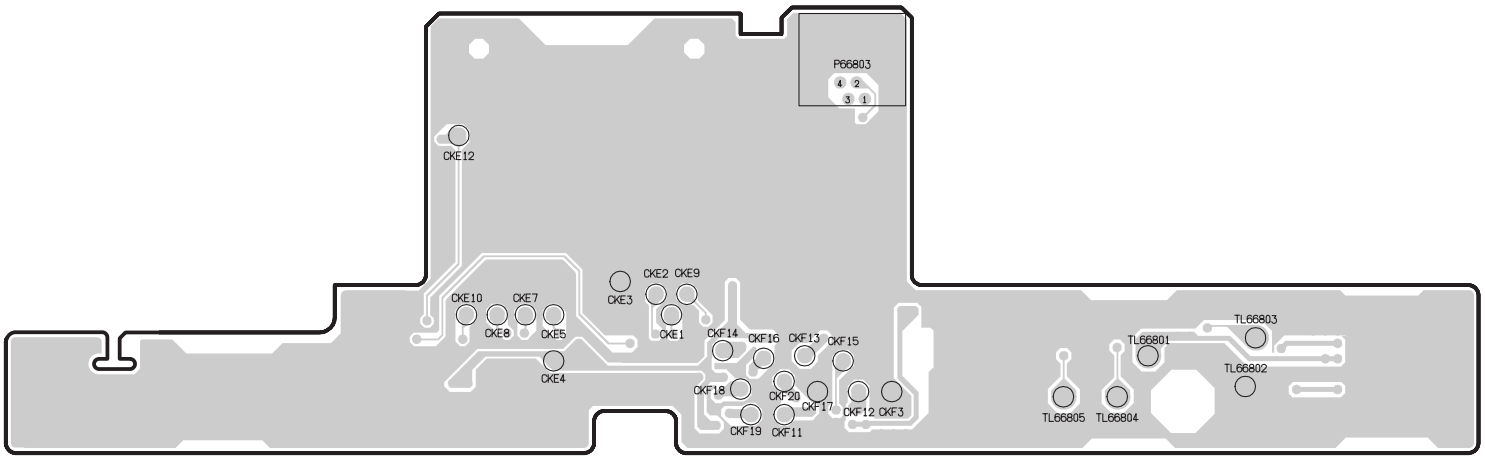
15.2.5. Main P.C.B. Address Information

Main P.C.B.

Integrated Circuit		TL7507	E-3	LB7412	A-8	C3707	E-5	C4804	E-7	C7405	A-8	R3914	C-8	R4852	D-7	R7531	E-2
IC1511	D-3	**Connector**		LB7413	A-7	C3709	E-8	C4805	E-7	C7406	A-8	R3915	C-8	R4855	D-7	R7532	D-2
IC1512	C-3	JK3902	D-8	**Filter**		C3710	E-8	C4806	E-7	C7408	A-8	R3924	B-8	R4856	D-8	R7533	D-2
IC2001	B-2	JK3903	B-8	FL7301	A-5	C3711	E-7	C4807	E-7	C7421	A-8	R3926	B-8	R4858	D-8	R7534	D-2
IC2501	F-5	JK4801	E-8	**Capacitor**		C3712	E-8	C4808	E-7	C7422	A-8	R3928	B-8	R4859	D-8	R7535	E-3
IC3001	C-5	P1531	F-6	C2001	C-4	C3713	E-8	C4809	E-7	C7423	A-8	R3929	B-8	R4860	D-8	R7536	E-3
IC3002	E-6	P2501	E-5	C2002	B-2	C3714	E-7	C4810	E-7	C7429	A-8	R4001	D-6	R4861	D-8	R7537	F-2
IC3701	E-7	P2571	E-5	C2003	E-5	C3716	E-8	C4811	D-7	C7430	B-8	R4003	C-6	R4862	D-8	R7538	E-3
IC4501	B-5	P3001	C-6	C2051	D-3	C3717	E-8	C4812	D-7	C7433	B-8	R4004	C-6	R4863	D-8	R7540	E-2
IC4801	F-7	P4001	B-5	C2052	D-3	C3718	E-8	C4813	D-7	C7501	F-2	R4005	D-6	R4864	F-7	R7541	D-2
IC6001	C-3	P4002	E-6	C2053	D-3	C3720	E-7	C4817	C-7	C7502	F-2	R4006	D-6	R4865	F-7	R7542	D-2
IC6002	C-2	P6001	F-3	C2054	C-4	C3721	F-8	C4819	D-7	C7503	F-2	R4007	C-6	R4866	E-7	R7543	D-2
IC6301	E-6	P6002	F-6	C2055	C-4	C3722	D-7	C4820	D-7	C7504	E-4	R4008	C-5	R4867	E-7	R7544	D-2
IC7301	A-3	P6003	F-6	C2099	E-5	C3723	E-8	C4821	C-7	C7505	B-2	R4011	C-6	R4868	F-8	R7546	D-2
IC7402	A-8	P6004	F-7	C2501	E-4	C3724	E-8	C4822	D-7	C7508	E-2	R4012	C-6	R4869	F-8	R37017	D-2
IC7501	E-2	P6005	F-8	C2502	E-4	C3725	E-7	C4824	D-8	C7509	E-3	R4081	A-2	R6001	B-3	**Switch**	
IC7503	E-4	PS6001	C-2	C2504	F-5	C3726	F-7	C4825	D-8	C7510	F-3	R4082	A-2	R6002	B-3	S1531	B-2
Transistor		**Diode**		C2505	F-4	C3727	F-8	C4826	E-7	C7511	F-2	R4083	A-2	R6004	C-3	S1532	E-3
Q1501	F-4	D1501	D-4	C2506	F-5	C3728	F-8	C4829	B-7	C7512	F-2	R4086	A-3	R6006	C-3	**Transformer**	
Q1502	A-4	D2001	C-4	C2507	F-4	C3729	E-7	C4830	B-7	C7513	F-2	R4087	A-3	R6008	C-3	T4081	A-2
Q3001	C-5	D2002	C-4	C2508	E-5	C3730	F-8	C4831	E-8	C7514	E-2	R4500	B-5	R6009	B-4	**Tuner**	
Q3004	D-4	D2502	F-5	C2509	E-4	C3731	F-8	C4832	F-8	C7515	D-3	R4501	B-6	R6010	B-4	TU7401	A-8
Q4001	D-6	D3001	E-6	C2510	E-5	C3732	E-8	C4833	E-7	C7520	E-3	R4502	B-6	R6012	B-4		
Q4002	C-6	D4501	B-5	C2511	E-5	C3733	D-8	C4836	E-7	C7521	D-2	R4503	B-6	R6013	B-4		
Q4082	A-2	D4502	A-2	C2512	F-5	C3734	F-7	C4837	E-7	**Resistor**		R4504	A-2	R6014	C-3		
Q4084	A-2	D6801	D-4	C2513	E-5	C3735	D-8	C4840	F-7	R1501	C-3	R4505	C-6	R6017	B-4		
Q4501	A-7	D7401	A-7	C2515	F-4	C3744	E-7	C4841	F-7	R1502	A-4	R4506	C-6	R6020	C-3		
Q4502	A-2	D7502	B-2	C2518	E-5	C3749	E-8	C4842	F-7	R1503	C-4	R4507	B-7	R6022	B-4		
Q6801	D-3	D7503	B-2	C2519	F-5	C3918	B-8	C4843	F-7	R1511	B-3	R4508	B-5	R6023	B-4		
Q7401	B-7	D7505	B-2	C2551	E-4	C3919	B-8	C4844	F-7	R1512	D-3	R4509	C-6	R6024	C-3		
Q7402	B-7	D7506	B-2	C2552	E-4	C3933	D-8	C4845	F-7	R1513	D-3	R4510	C-6	R6026	B-4		
Q7501	F-2	D7507	D-2	C2561	E-5	C4004	C-6	C4846	E-7	R2001	E-4	R4511	C-6	R6027	B-4		
Q7502	F-2	**FL Display Tube**		C2562	C-4	C4005	C-6	C5001	C-5	R2002	C-4	R4512	C-6	R6028	B-4		
Q7503	E-3	DP7501	E-2	C2571	E-6	C4006	C-6	C5002	C-5	R2099	D-5	R4513	B-7	R6029	C-4		
Transistor-resistor		**Crystal Osillator**		C3001	C-6	C4007	C-6	C5003	C-5	R2501	E-5	R4515	B-6	R6101	B-3		
QR4001	C-6	X3002	C-5	C3002	D-6	C4008	C-6	C5004	C-5	R2502	E-5	R4518	B-6	R6102	B-4		
QR4082	A-3	X6001	B-3	C3003	D-5	C4009	C-6	C5005	C-5	R2503	F-5	R4519	C-6	R6103	B-4		
QR4501	A-7	X7501	F-2	C3005	D-6	C4011	C-6	C5006	C-5	R2514	E-5	R4520	C-6	R6201	C-2		
QR4801	F-8	X7502	F-2	C3006	D-5	C4012	C-6	C5007	C-5	R2515	E-5	R4521	C-6	R6801	D-3		
QR4802	E-8	**IC Protector**		C3007	D-5	C4013	C-6	C5008	C-5	R2516	F-5	R4522	B-5	R6802	D-3		
QR4803	F-8	IP6001	C-2	C3008	D-5	C4017	C-6	C6001	B-3	R2520	E-5	R4525	B-5	R6803	C-4		
QR4804	E-8	**Coil**		C3009	D-5	C4019	C-6	C6002	B-3	R2521	E-5	R4526	B-6	R7301	A-3		
QR4805	E-8	L3002	D-6	C3010	E-6	C4081	A-2	C6005	D-3	R2551	C-4	R4527	B-6	R7302	A-4		
QR4806	D-8	L3003	D-5	C3011	D-5	C4082	A-2	C6008	B-3	R2552	E-4	R4529	B-5	R7303	A-3		
QR4807	B-6	L3004	C-4	C3012	D-5	C4083	A-2	C6009	B-3	R2561	C-4	R4534	B-5	R7304	A-3		
QR4808	B-7	L3005	C-5	C3014	D-5	C4084	A-2	C6010	B-4	R2562	E-5	R4538	B-5	R7305	A-3		
QR4809	D-8	L3006	C-5	C3015	D-5	C4086	A-2	C6011	B-4	R2563	C-4	R4539	B-5	R7306	A-3		
QR4813	E-8	L3701	F-8	C3017	D-5	C4501	C-6	C6012	C-3	R2564	E-5	R4540	B-5	R7307	A-3		
QR4814	F-7	L3702	F-7	C3019	D-5	C4502	B-6	C6014	B-3	R2565	E-5	R4553	B-6	R7308	A-3		
QR6801	D-3	L3703	C-8	C3020	D-5	C4503	B-6	C6015	B-3	R3001	C-6	R4557	C-6	R7309	A-3		
QR7401	B-7	L3704	F-7	C3021	D-5	C4504	B-6	C6016	B-3	R3002	D-5	R4801	E-8	R7310	A-5		
QR7502	F-2	L4081	A-3	C3023	D-5	C4505	C-6	C6019	C-3	R3005	E-6	R4802	D-8	R7311	A-4		
QR7503	E-3	L4501	B-5	C3024	D-5	C4506	C-6	C6020	C-3	R3006	E-6	R4803	E-8	R7401	B-8		
Test Point		L4502	B-5	C3025	C-5	C4507	C-6	C6101	B-3	R3010	E-6	R4804	D-8	R7402	B-8		
CL6003	B-3	L4503	B-7	C3028	C-5	C4508	C-5	C6102	B-3	R3009	C-5	R4805	D-7	R7410	A-8		
CL6004	B-3	L5001	C-5	C3029	C-5	C4509	C-5	C6103	B-3	R3013	C-5	R4806	D-8	R7411	A-7		
CL6005	C-3	L6102	B-3	C3030	C-5	C4510	C-5	C6104	B-3	R3014	C-5	R4807	D-8	R7415	B-7		
CL6006	B-3	L7402	F-8	C3031	C-5	C4511	B-5	C6308	E-5	R3017	C-5	R4808	D-7	R7417	A-7		
CL6009	C-3	L7403	A-8	C3032	C-5	C4512	B-5	C6801	C-4	R3021	D-5	R4809	C-7	R7418	A-7		
CL6010	C-3	LB3101	E-8	C3033	C-5	C4513	B-5	C7301	A-3	R3022	D-5	R4810	D-7	R7501	D-2		
CL6011	C-3	LB3102	E-8	C3034	C-5	C4514	B-5	C7302	A-3	R3023	D-5	R4811	D-7	R7502	D-2		
CL6012	C-3	LB3103	F-8	C3035	C-5	C4515	B-5	C7303	A-3	R3030	C-4	R4812	D-8	R7503	E-2		
CL6013	B-3	LB3104	D-8	C3036	C-5	C4516	B-5	C7304	A-3	R3031	E-6	R4813	D-7	R7504	F-3		
CL6014	C-3	LB3105	D-8	C3037	C-5	C4517	B-5	C7305	A-3	R3032	C-6	R4814	D-8	R7505	F-2		
CL7501	E-3	LB3106	C-8	C3038	C-5	C4518	B-5	C7306	A-4	R3035	C-5	R4815	A-7	R7506	F-2		
CL7502	D-2	LB3107	C-8	C3039	C-5	C4519	A-2	C7307	A-4	R3037	C-4	R4816	B-7	R7508	E-2		
CL7524	B-2	LB3108	B-8	C3040	C-4	C4520	A-2	C7308	A-3	R3701	E-7	R4817	D-7	R7511	D-2		
TL23	D-3	LB3110	B-8	C3041	C-4	C4521	B-6	C7309	A-3	R3702	E-7	R4818	D-7	R7512	D-2		
TL24	B-3	LB3111	B-8	C3042	E-6	C4522	B-5	C7310	A-3	R3703	E-8	R4819	D-8	R7513	F-2		
TL1002	A-3	LB4101	D-8	C3043	E-6	C4523	B-6	C7311	A-3	R3704	E-8	R4820	D-7	R7514	F-2		
TL2015	C-4	LB4102	D-8	C3044	C-5	C4524	B-6	C7312	A-4	R3705	E-8	R4833	D-8	R7515	F-2		
TL2502	E-4	LB4103	D-8	C3048	D-5	C4525	B-6	C7313	A-3	R3706	E-7	R4834	E-7	R7516	E-3		
TL4501	B-5	LB4104	D-8	C3050	D-5	C4526	B-6	C7314	A-3	R3707	E-7	R4835	E-7	R7517	E-3		
TL4502	A-5	LB4105	C-8	C3051	E-6	C4534	C-6	C7315	A-3	R3708	F-7	R4836	E-7	R7518	F-2		
TL4507	B-5	LB4107	C-8	C3052	E-6	C4535	B-5	C7316	A-3	R3709	E-8	R4837	E-7	R7519	F-2		
TL6002	B-3	LB7403	A-8	C3053	D-4	C4537	B-5	C7317	A-4	R3711	E-8	R4838	E-7	R7520	F-2		
TL6004	C-3	LB7407	B-8	C3074	D-5	C4538	B-6	C7318	A-3	R3712	E-7	R4841	E-8	R7522	D-3		
TL6010	C-3	LB7408	B-8	C3701	E-8	C4773	B-6	C7319	A-3	R3907	E-8	R4842	D-8	R7523	E-2		
TL7501	E-3	LB7409	A-8	C3702	E-8	C4774	B-6	C7320	A-3	R3908	E-8	R4843	E-7	R7525	D-2		
TL7502	B-2	LB7410	A-8	C3704	E-7	C4801	E-8	C7321	C-7	R3909	F-8	R4844	E-7	R7528	F-2		
TL7504	D-2	LB7411	B-8	C3705	F-7	C4802	D-8	C7322	C-7	R3912	D-8	R4845	E-7	R7529	F-2		
				C3706	F-7	C4803	E-6	C7401	A-7	R3913	D-8	R4848	D-7	R7530	E-2		

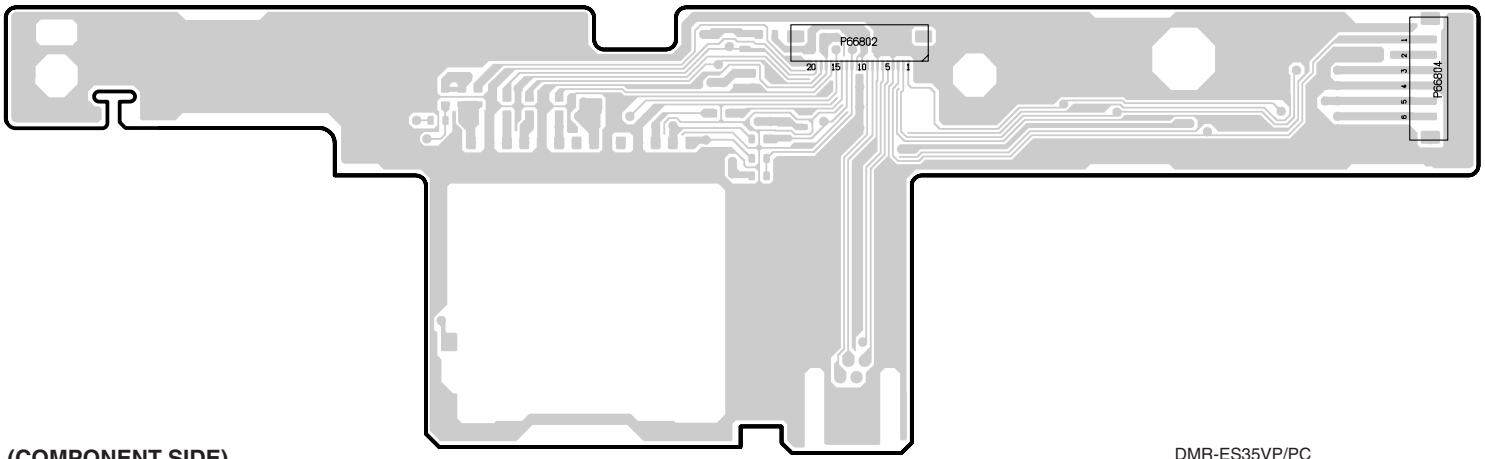
15.3. DV Jack P.C.B.

DV Jack P.C.B.



(FOIL SIDE)

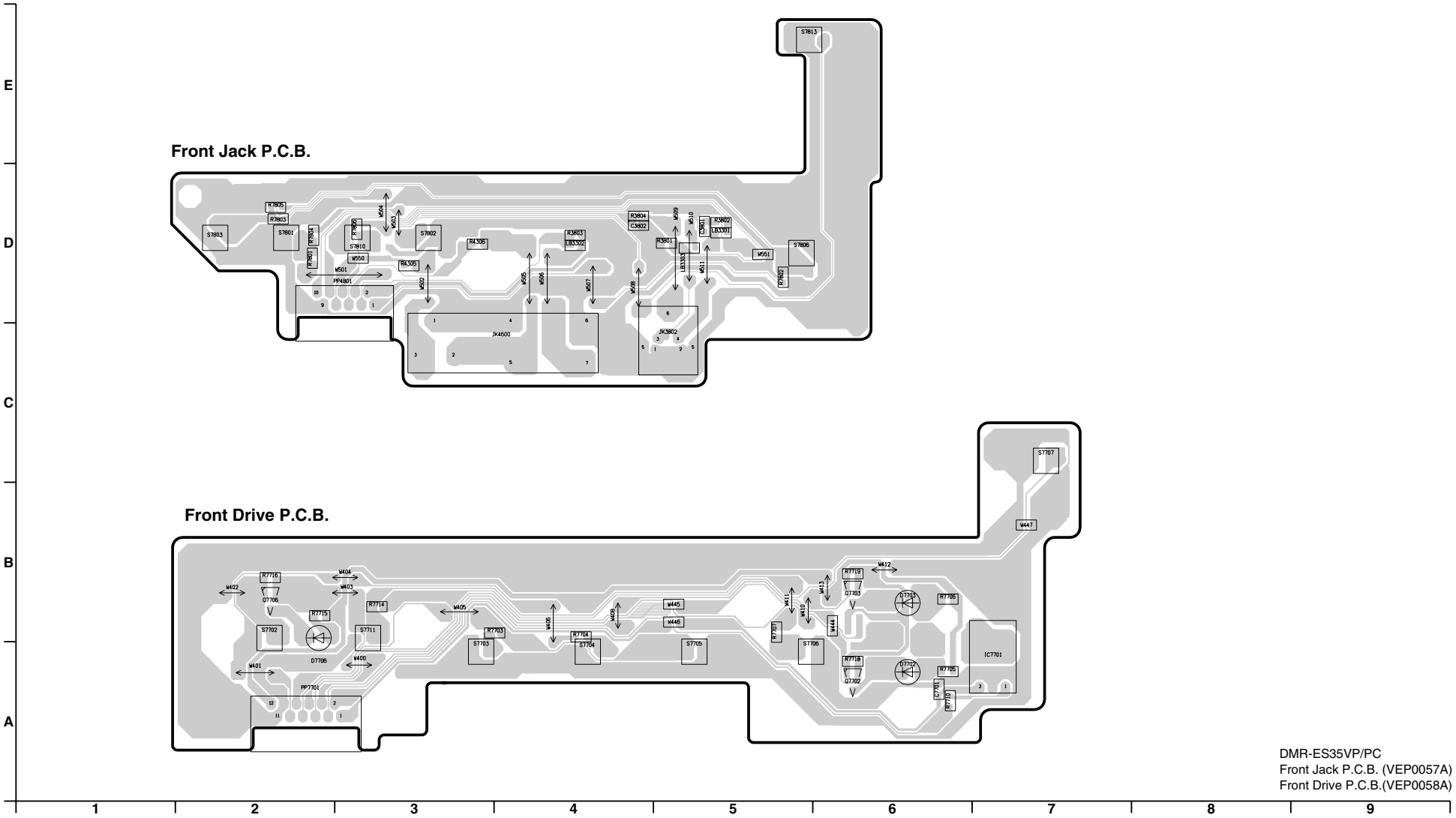
DMR-ES35VP/PC
DV Jack P.C.B. (FOIL SIDE)
(VEP001P1C)



(COMPONENT SIDE)

DMR-ES35VP/PC
DV Jack P.C.B. (COMPONENT SIDE)
(VEP001P1C)

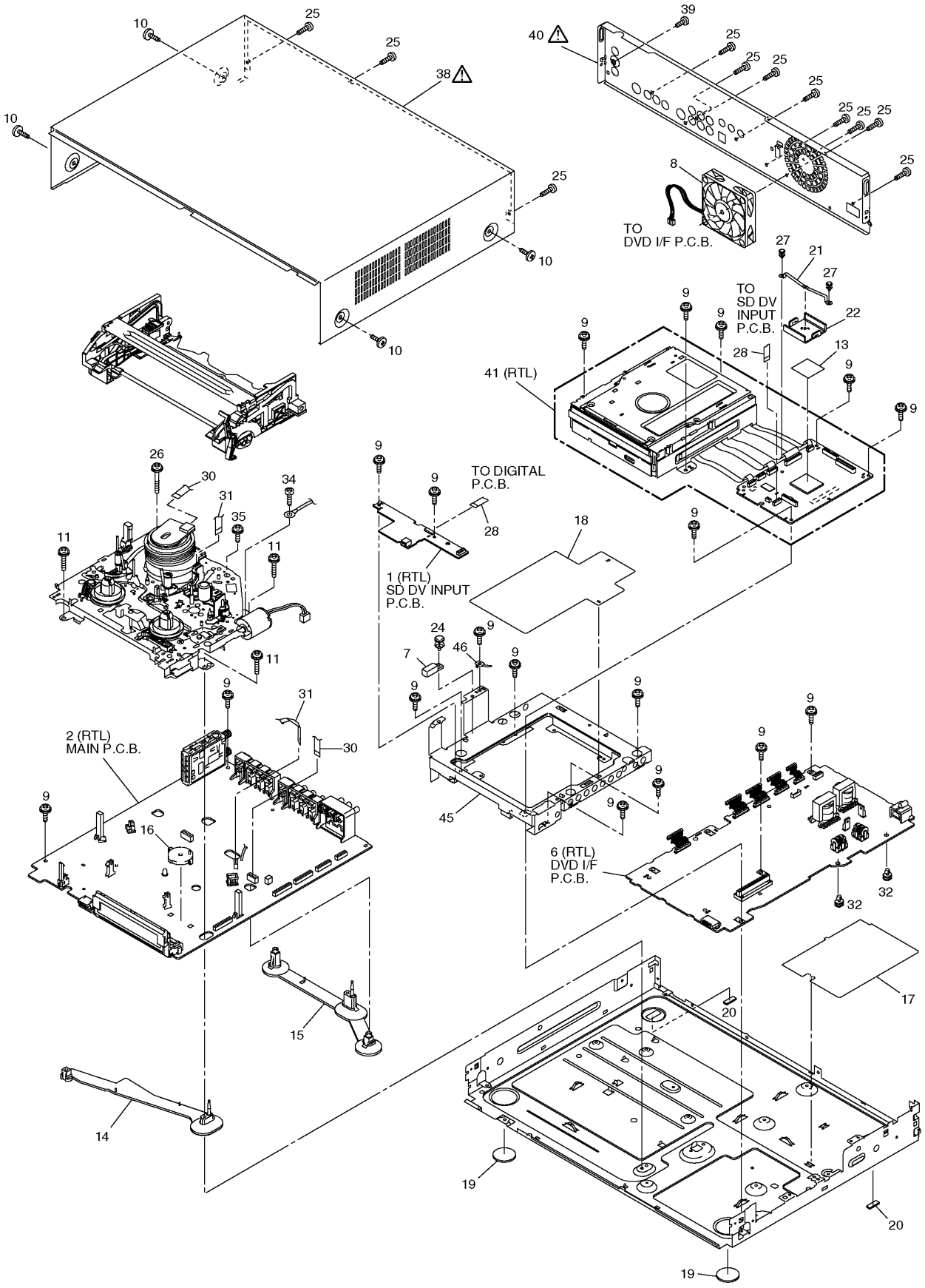
15.4. Front Jack P.C.B., FL Drive P.C.B.



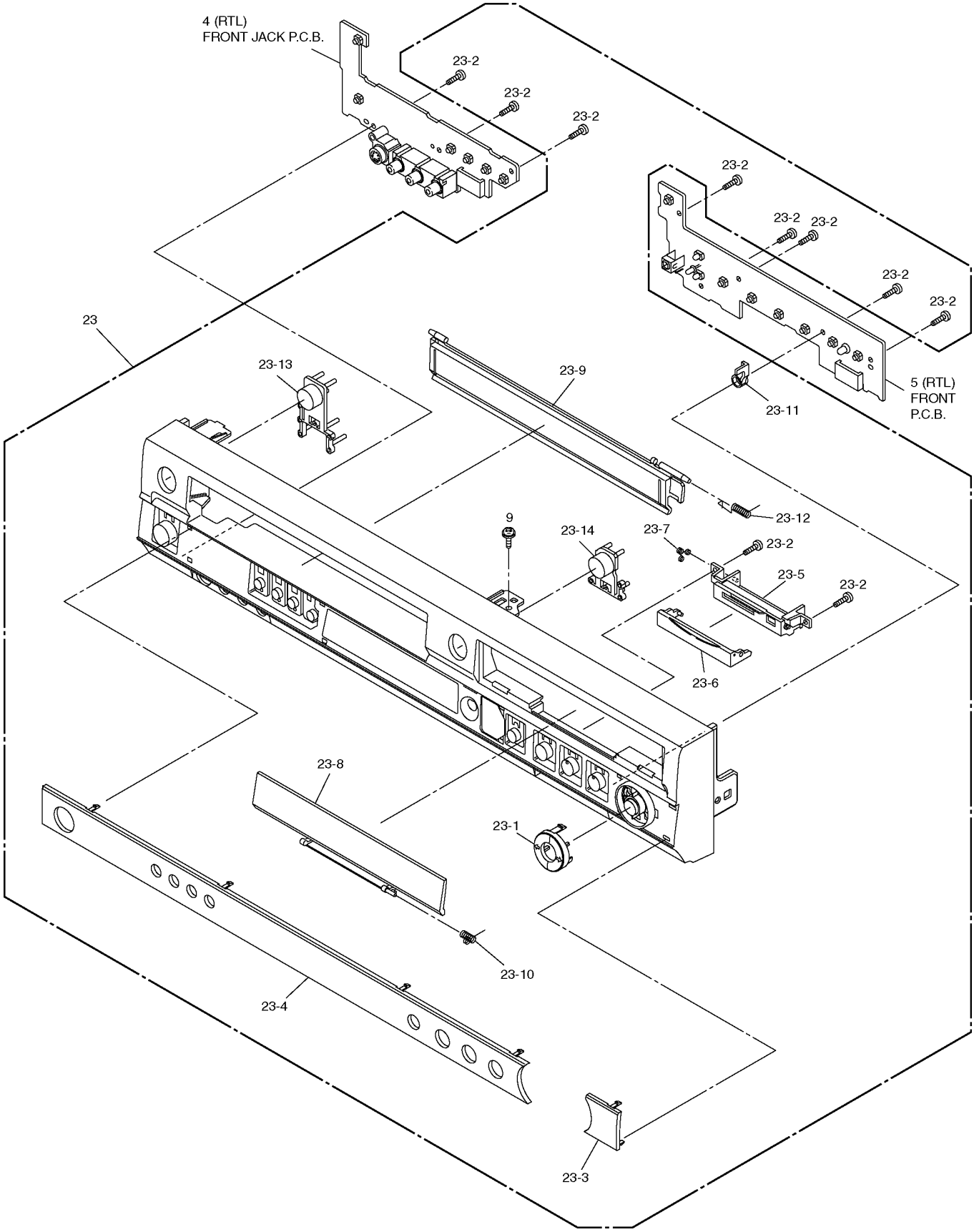
DMR-ES35VP/PC
Front Jack P.C.B. (VEP0057A)
Front Drive P.C.B.(VEP0058A)

16 Exploded Views

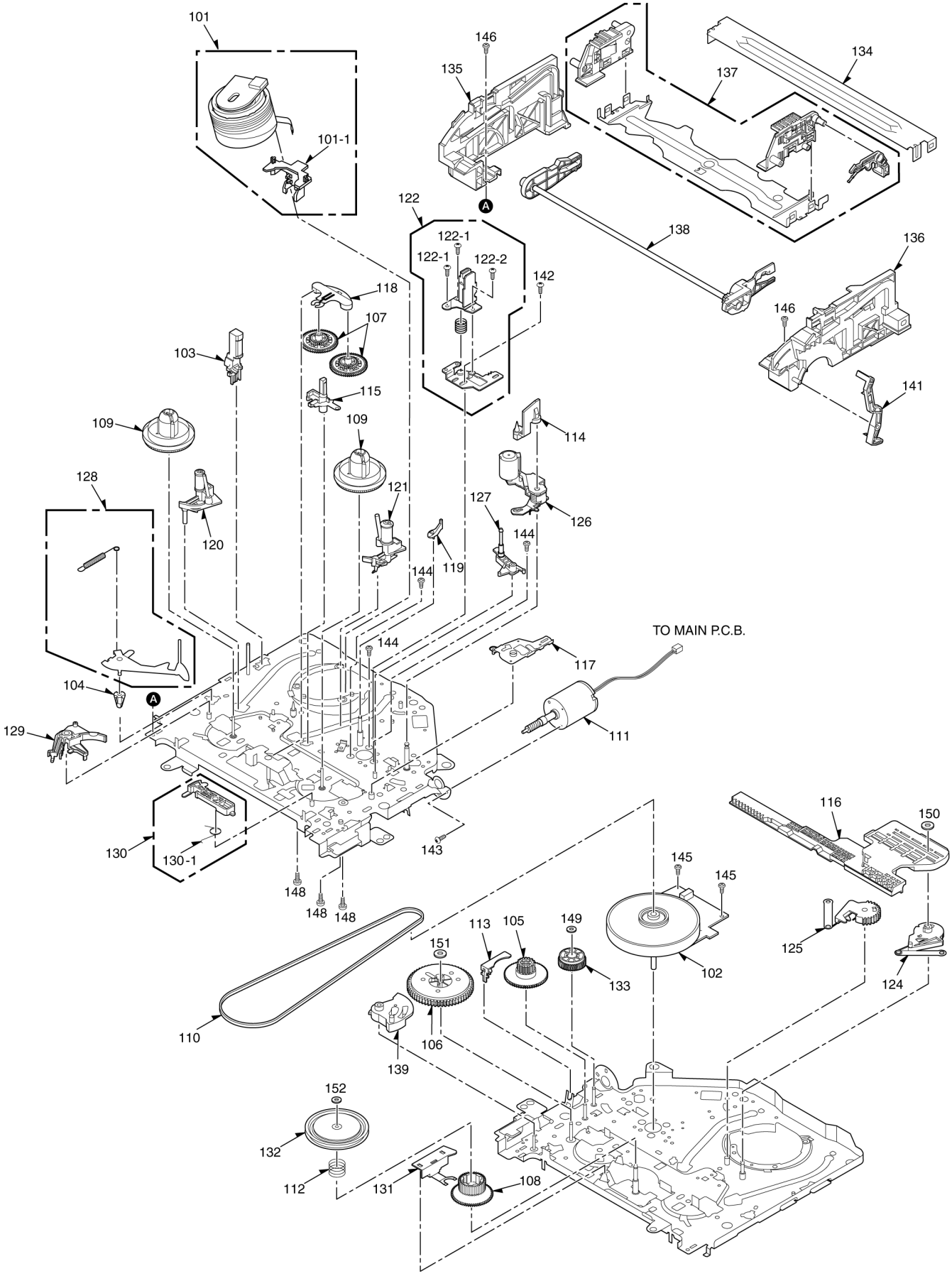
16.1. Casing Parts & Mechanism Section1



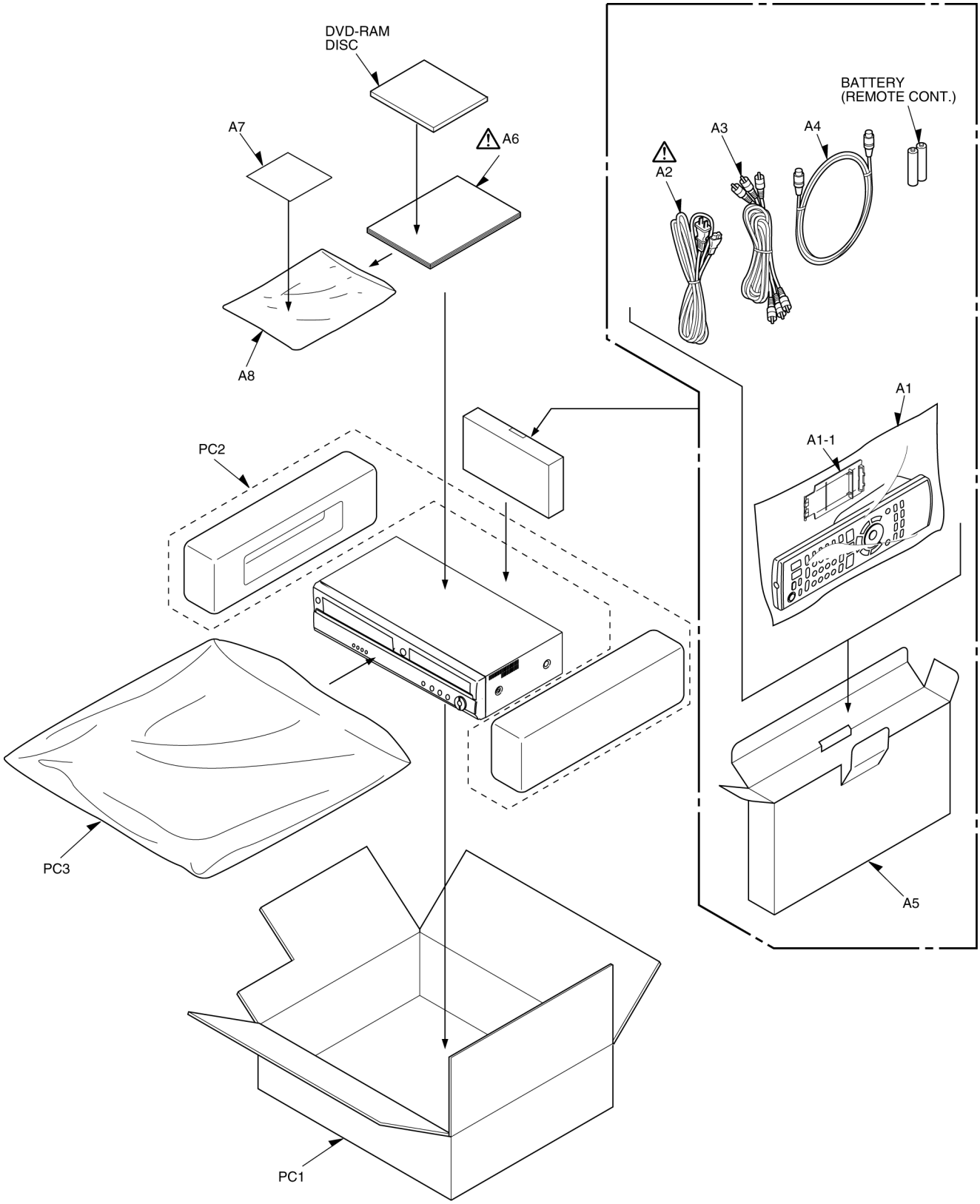
16.2. Casing Parts & Mechanism Section 2



16.3. VHS Mechanism Section



16.4. Packing & Accessories Section



17 Replacement Parts List

Notes:

*Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

*Warning: This product uses a laser diode. Refer to caution statements.

*Capacity values are in microfarads (µF) unless specified otherwise, P=Pico-farads (pF), F=Farads (F).

*Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM).

*The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

*"(IA)-(IB)", marks in Remarks indicate languages of instruction manuals. [(IA): English, (IB): Canadian French]

*Parts indicated with PAVC-CSG in the Remarks column are supplied by PAVC-CSG.

*All parts except parts indicated with (PAVC-CSG) in the Remarks column are supplied by PAVCSG.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
##	VEPV0054BT	MAIN P.C.B.		(RTL)
C2001	ECJ1VC1H330J	50V 33P	1	
C2002	F1H0J1050010	6.3V 1U	1	
C2003	ECJ1VF1A105Z	10V 1U	1	
C2051	F1J0J106A014	6.3V 10U	1	
C2052	F1J0J106A014	6.3V 10U	1	
C2053	ECEA1CKS100B	16V 10U	1	
C2054	F1H1H392A013	50V 3900	1	
C2055	F1H1C104A008	16V 0.1U	1	
C2099	ECJ1VC1H681J	50V 680P	1	
C2501	F1H1C104A008	16V 0.1U	1	
C2502	ECA1AAK221XB	10V 220P	1	
C2504	F1H1E223A002	25V 0.022U	1	
C2505	F1H1E223A002	25V 0.022U	1	
C2506	ECJ1VB1A224K	10V 0.22U	1	
C2507	F1H1H102A219	50V 1000P	1	
C2508	ECJ1VB1H182K	50V 1800P	1	
C2509	ECA1CAK220XB	16V 22P	1	
C2510	F1H1C104A041	16V 0.1U	1	
C2511	F1H1C104A041	16V 0.1U	1	
C2512	F1H1C104A041	16V 0.1U	1	
C2513	ECJ1VF1A105Z	10V 1U	1	
C2515	F1H1H103A220	50V 0.01U	1	
C2518	F1H1H103A220	50V 0.01U	1	
C2519	F1H1H103A220	50V 0.01U	1	
C2551	ECJ1VB1C473K	16V 0.047U	1	
C2552	ECJ1VB1C683K	16V 0.068U	1	
C2561	ECJ1VB1C683K	16V 0.068U	1	
C2562	ECJ1VB1C473K	16V 0.047U	1	
C2571	ECA1CAM221XB	16V 220U	1	
C3001	ECJ1VC1H151J	50V 150P	1	
C3002	F1H1C104A041	16V 0.1U	1	
C3003	F1H1C104A041	16V 0.1U	1	
C3005	ECJ1VC1H220J	50V 22P	1	
C3006	F1H1C104A041	16V 0.1U	1	
C3007	F1H0J1050010	6.3V 1U	1	
C3008	ECA1HAK4R7XB	50V 4.7	1	
C3009	F1H0J1050010	6.3V 1U	1	
C3010	F1H0J1050010	6.3V 1U	1	
C3011	F1H1C104A041	16V 0.1U	1	
C3012	F2A0J470A245	6.3V 47U	1	
C3014	F1H1C104A041	16V 0.1U	1	
C3015	F1H0J1050010	6.3V 1U	1	
C3017	F1H1C104A041	16V 0.1U	1	
C3019	F1H1C104A041	16V 0.1U	1	
C3020	ECA1HAK3R3XB	50V 3.3	1	
C3021	ECA1CAK100XB	16V 10U	1	
C3023	F1H1H103A219	50V 0.01U	1	
C3024	ECJ1VC1H331J	50V 330P	1	
C3025	F1H1H103A220	50V 0.01U	1	
C3028	ECA1HAK4R7XB	50V 4.7	1	
C3029	ECA1HAKR47XB	50V 47P	1	
C3030	F1H1E223A002	25V 0.022U	1	
C3031	F1H1C333A071	16V 0.033U	1	
C3032	ECA1HAK4R7XB	50V 4.7	1	
C3033	F1H1C104A041	16V 0.1U	1	
C3034	ECA1HAK2R2XB	50V 2.2U	1	
C3035	ECJ1VB1H472K	50V 4700P	1	
C3036	ECA0JAK470XB	6.3V 47P	1	
C3037	F1H1C104A041	16V 0.1U	1	
C3038	ECJ1VC1H040C	50V 40P	1	
C3039	ECA1HAK010XB	50V 1U	1	
C3040	F1H1H103A220	50V 0.01U	1	
C3041	F1H1H103A220	50V 0.01U	1	
C3043	F1J0J106A014	6.3V 10U	1	
C3044	F1H1C104A041	16V 0.1U	1	
C3048	F1H1H103A219	50V 0.01U	1	
C3050	F1H1C104A041	16V 0.1U	1	
C3051	F1H0J1050010	6.3V 1U	1	
C3052	F2A0J470A245	6.3V 47U	1	
C3053	F1H1C104A041	16V 0.1U	1	
C3074	F1H1C104A041	16V 0.1U	1	
C3701	ECA0JAK470XB	6.3V 47P	1	
C3702	F1H1C104A041	16V 0.1U	1	
C3704	F1H1C104A041	16V 0.1U	1	
C3705	F1H1H103A219	50V 0.01U	1	
C3706	F1H1C104A041	16V 0.1U	1	
C3707	ECEA0JKA220B	6.3V 22U	1	
C3709	ECA0JAK470XB	6.3V 47P	1	
C3710	F1H1C104A041	16V 0.1U	1	
C3711	F1H1H103A220	50V 0.01U	1	
C3712	F1H0J1050010	6.3V 1U	1	
C3713	F1H0J1050010	6.3V 1U	1	
C3714	ECA1CAK100XB	16V 10U	1	
C3716	F1H0J1050010	6.3V 1U	1	
C3717	F1H0J1050010	6.3V 1U	1	
C3718	F1H1C104A041	16V 0.1U	1	
C3720	F1H1C104A041	16V 0.1U	1	
C3721	F1H0J1050010	6.3V 1U	1	
C3722	F1H0J1050010	6.3V 1U	1	
C3723	F1H0J1050010	6.3V 1U	1	
C3724	F1H1H103A220	50V 0.01U	1	
C3725	F1H1H103A220	50V 0.01U	1	
C3726	F1H1C104A041	16V 0.1U	1	
C3727	ECA0JM471B	6.3V 470U	1	
C3728	ECA0JM471B	6.3V 470U	1	
C3729	F1H0J1050010	6.3V 1U	1	
C3730	ECA0JM471B	6.3V 470U	1	
C3731	F1H0J1050010	6.3V 1U	1	
C3732	F1H1H103A220	50V 0.01U	1	
C3733	ECA0JM471B	6.3V 470U	1	
C3734	ECA0JAK470XB	6.3V 47P	1	
C3735	ECA0JM471B	6.3V 470U	1	
C3744	F1H1H103A220	50V 0.01U	1	
C3749	F1H0J1050010	6.3V 1U	1	
C3918	F1H1C104A041	16V 0.1U	1	
C3919	F1H1H103A220	50V 0.01U	1	
C3933	F2A0J471A247	6.3V 470U	1	
C4004	ECJ1VB1H182K	50V 1800P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C4005	ECEA0JKA220B	6.3V 22U	1	
C4006	ECA1HAK4R7XB	50V 4.7	1	
C4007	ECJ1VB1H182K	50V 1800P	1	
C4008	ECA1HAK3R3XB	50V 3.3	1	
C4009	ECEA0JKA330B	6.3V 33U	1	
C4011	F1H1H103A219	50V 0.01U	1	
C4012	ECA1HAK4R7XB	50V 4.7	1	
C4013	F1H1H103A220	50V 0.01U	1	
C4017	ECA1CAK100XB	16V 10U	1	
C4019	ECA1CAK100XB	16V 10U	1	
C4081	F1H1E223A002	25V 0.022U	1	
C4082	F1H1H471A219	50V 470P	1	
C4083	ECA0JAK470XB	6.3V 47P	1	
C4084	ECJ1VB1H182K	50V 1800P	1	
C4086	ECQB1H333JF3	50V 0.033U	1	
C4501	ECQB1H473JF3	50V 0.047U	1	
C4502	ECA1CAK100XB	16V 10U	1	
C4503	ECA1CAK100XB	16V 10U	1	
C4504	ECA1CAK100XB	16V 10U	1	
C4505	ECEA0JKA330B	6.3V 33U	1	
C4506	ECA1CAK100XB	16V 10U	1	
C4507	ECEA0JKA220B	6.3V 22U	1	
C4508	F1H1C333A071	16V 0.033U	1	
C4509	F1H1H103A220	50V 0.01U	1	
C4510	F1H1H103A220	50V 0.01U	1	
C4511	F1H1C104A041	16V 0.1U	1	
C4512	ECJ1VB1A224K	10V 0.22U	1	
C4513	ECEA0JKA220B	6.3V 22U	1	
C4514	ECA1CAK100XB	16V 10U	1	
C4515	ECEA0JKA330B	6.3V 33U	1	
C4516	ECA1CAK100XB	16V 10U	1	
C4517	ECEA0JKA220B	6.3V 22U	1	
C4518	F1H1H103A220	50V 0.01U	1	
C4519	F1H1C104A008	16V 0.1U	1	
C4520	ECEA0JKA220B	6.3V 22U	1	
C4521	ECA1CAK100XB	16V 10U	1	
C4522	ECQB1H473JF3	50V 0.047U	1	
C4523	ECEA0JKA220B	6.3V 22U	1	
C4524	F1H1C104A041	16V 0.1U	1	
C4525	ECA1CAK101XB	16V 100U	1	
C4526	ECA1CAK100XB	16V 10U	1	
C4534	ECQB1H153JF3	50V 0.015U	1	
C4535	ECQB1H153JF3	50V 0.015U	1	
C4537	ECJ2VC1H560G	50V 56P	1	
C4538	F1H1H103A220	50V 0.01U	1	
C4773	ERJ3GEYJ682V	1/10W 6.8K	1	
C4774	ERJ3GEYJ682V	1/10W 6.8K	1	
C4801	ECJ1VC1H102J	50V 1000P	1	
C4802	ECJ1VC1H102J	50V 1000P	1	
C4803	ECA1HAK010XB	50V 10U	1	
C4804	ECA1HAK010XB	50V 10U	1	
C4805	ECA1CAK100XB	16V 10U	1	
C4806	ECA1CAK100XB	16V 10U	1	
C4807	ECA1HAK3R3XB	50V 3.3U	1	
C4808	ECA1HAK3R3XB	50V 3.3U	1	
C4809	ECA1CAK100XB	16V 10U	1	
C4810	ECA1HAK4R7XB	50V 4.7	1	
C4811	ECA1HAKR47XB	50V 47U	1	
C4812	ECA1HAKR47XB	50V 47U	1	
C4813	ECA1CAK100XB	16V 10U	1	
C4817	ECJ1VB1C105K	16V 1U	1	
C4819	ECA1CAK100XB	16V 10U	1	
C4820	ECA1CAK100XB	16V 10U	1	
C4821	ECJ1VB1C105K	16V 1U	1	
C4822	ECA1CAK100XB	16V 10U	1	
C4824	ECA1CAK100XB	16V 10U	1	
C4825	ECA1CAK100XB	16V 10U	1	
C4826	ECA1HAKR47XB	50V 47U	1	
C4829	ECA1CAK100XB	16V 10U	1	
C4830	ECA1CAK100XB	16V 10U	1	
C4831	F1H1C104A041	16V 0.1U	1	
C4832	F2A0J470A599	6.3V 47U	1	
C4833	ECA1HAKR47XB	50V 47U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C4836	ECA1CAK100XB	16V 10U	1	
C4837	ECA1HAK010XB	50V 1U	1	
C4840	F1H1C104A041	16V 0.1U	1	
C4841	ECQV1H104JL3	50V 0.1U	1	
C4842	F1H1C104A041	16V 0.1U	1	
C4843	F2A1C471A236	16V 470U	1	
C4844	F1H1C104A041	16V 0.1U	1	
C4845	F1H1C104A041	16V 0.1U	1	
C4846	F2A1C471A236	16V 470U	1	
C5001	F1H1H103A219	50V 0.01U	1	
C5002	F1H1H103A219	50V 0.01U	1	
C5003	F1H1H103A219	50V 0.01U	1	
C5004	F1H1H103A219	50V 0.01U	1	
C5005	F1H1C104A041	16V 0.1U	1	
C5006	F2A0J101A245	6.3V 100U	1	
C5007	F1H1C104A041	16V 0.1U	1	
C5008	F1H0J1050010	6.3V 1U	1	
C6001	ECJ1VC1H180J	50V 18P	1	
C6002	ECJ1VC1H220J	50V 22P	1	
C6005	ECEA1HKS3R3B	50V 3.3	1	
C6008	ECJ1VC1H471J	50V 470P	1	
C6009	F1H1H103A220	50V 0.01U	1	
C6010	ECJ1VC1H120J	50V 12P	1	
C6011	ECJ1VC1H120J	50V 12P	1	
C6012	F1H1C104A008	16V 0.1U	1	
C6014	F1H1H102A219	50V 1000P	1	
C6015	F1H1C333A071	16V 0.033U	1	
C6016	F1H1H102A219	50V 1000P	1	
C6019	F1J1H104A578	50V 0.1U	1	
C6020	F1H1H102A219	50V 1000P	1	
C6101	F1H1H103A220	50V 0.01U	1	
C6102	ECJ1VF1A105Z	10V 1U	1	
C6103	ECJ1VC1H561J	50V 560P	1	
C6104	F1H1H103A220	50V 0.01U	1	
C6308	ECJ1VB1C105K	16V 1U	1	
C7301	ECA1HAK2R2XB	50V 2.2U	1	
C7302	F1H1C333A071	16V 0.033U	1	
C7303	F1H1C104A041	16V 0.1U	1	
C7304	F1H1E223A002	25V 0.022U	1	
C7305	F1H1C104A041	16V 0.1U	1	
C7306	ECA1HAK3R3XB	50V 3.3	1	
C7307	ECA1HAK3R3XB	50V 3.3	1	
C7308	ECA1CAK100XB	16V 10U	1	
C7309	ECJ1VF1C334Z	16V 0.33U	1	
C7310	F1H1C104A041	16V 0.1U	1	
C7311	ECJ1VB1A224K	10V 0.22U	1	
C7312	F1H1H102A219	50V 1000P	1	
C7313	ECA1HAK4R7XB	50V 4.7	1	
C7314	ECA1HAK2R2XB	50V 2.2U	1	
C7315	ECA1HAK2R2XB	50V 2.2U	1	
C7316	F1H1E223A002	25V 0.022U	1	
C7317	F1H1E223A002	25V 0.022U	1	
C7318	ECA1HAK2R2XB	50V 2.2U	1	
C7319	ECA0JAK470XB	6.3V 47P	1	
C7320	F1H1H103A220	50V 0.01U	1	
C7321	ECJ1VB1C105K	16V 1U	1	
C7322	ECJ1VB1C105K	16V 1U	1	
C7401	ECA1HAK010XB	50V 1U	1	
C7405	F1H0J1050010	6.3V 1U	1	
C7406	F1H1H103A220	50V 0.01U	1	
C7408	ECJ2FB1A105K	10V 1U	1	
C7421	ECA0JAK470XB	6.3V 47P	1	
C7422	F1H1H103A219	50V 0.01U	1	
C7423	F1H1H103A219	50V 0.01U	1	
C7429	F1H1H103A219	50V 0.01U	1	
C7430	F1H1H103A219	50V 0.01U	1	
C7433	ECA1HAK4R7XB	50V 4.7U	1	
C7501	F1H1H103A220	50V 0.01U	1	
C7502	F1H1H103A220	50V 0.01U	1	
C7503	F1H1H103A220	50V 0.01U	1	
C7504	F1H1C104A008	16V 0.1U	1	
C7505	ECA0JM471B	6.3V 470U	1	
C7508	F1H1C104A008	16V 0.1U	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7509	F1H1C104A008	16V 0.1U	1	
C7510	ECJ1VC1H180J	50V 18P	1	
C7511	ECJ1VC1H180J	50V 18P	1	
C7512	ECJ1VC1H220J	50V 22P	1	
C7513	ECJ1VC1H150J	50V 15P	1	
C7514	F1H1C104A008	16V 0.1U	1	
C7515	ECJ1VF1A105Z	10V 1U	1	
C7520	ECJ1VF1C104Z	16V 0.1U	1	
D1501	B3EA00000072	LED	1	
D2001	B0AACK000004	DIODE	1	
D2002	B0AACK000004	DIODE	1	
D2502	MAZ4160NMF	DIODE	1	
D4501	B0AACK000004	DIODE	1	
D4502	MAZ4056NHF	DIODE	1	
D7401	MAZ4300NMF	DIODE	1	
D7502	B0AACK000004	DIODE	1	
D7503	B0AACK000004	DIODE	1	
D7505	B0AACK000004	DIODE	1	
D7506	B0AACK000004	DIODE	1	
D7507	MAZ4180NMF	DIODE	1	
DP7501	A2BD00000155	FL DISPLAY TUBE	1	
FL7301	EFCT4R5MS5W	FILTER	1	
IC1511	B3NAA0000117	IC	1	
IC1512	B3NAA0000117	IC	1	
IC2001	C0CBCDC00020	IC	1	
IC2501	C1AB00001767	IC	1	
IC3001	C1AB00002083	IC	1	
IC3002	C0CBCDG00006	IC	1	
IC3701	C1AB00002490	IC	1	
IC4501	AN3656NFBPBV	IC	1	
IC4801	C0CBCDC00027	IC	1	
IC6001	C2CBHF000465	IC	1	
IC6002	C0EBH0000172	IC	1	
IC6301	C0CBCDC00020	IC	1	
IC7301	AN5832SA-E1V	IC	1	
IC7402	C0CBCDD00006	IC	1	
IC7501	MN67788RD	IC	1	
IC7503	C0EBE0000457	IC	1	
IP6001	K5H5012A0010	IC PROTECTOR	1	⚠
J1	VEE0U97	EARTH WIRE	1	
JK3902	K1U717B00006	JACK,AV OUT	1	
JK3903	K1U412B00004	JACK,AV IN1	1	
JK4801	K1U407B00004	JACK,DVD OUT	1	
K2597	ERJ3GEY0R00V	1/10W 0	1	
K3001	ERJ3GEY0R00V	1/10W 0	1	
K3004	ERJ3GEY0R00V	1/10W 0	1	
K3008	ERJ3GEY0R00V	1/10W 0	1	
K3010	ERJ3GEY0R00V	1/10W 0	1	
K3012	ERJ3GEY0R00V	1/10W 0	1	
K3016	ERJ3GEY0R00V	1/10W 0	1	
K3032	ERJ6GEY0R00V	1/8W 0	1	
K3703	ERJ3GEY0R00V	1/10W 0	1	
K3707	ERJ3GEY0R00V	1/10W 0	1	
K3710	ERJ3GEY0R00V	1/10W 0	1	
K3711	ERJ3GEY0R00V	1/10W 0	1	
K3904	ERJ6GEY0R00V	1/8W 0	1	
K4081	ERJ3GEY0R00V	1/10W 0	1	
K4506	ERJ3GEY0R00V	1/10W 0	1	
K4801	ERJ3GEY0R00V	1/10W 0	1	
K4802	ERJ3GEY0R00V	1/10W 0	1	
K4812	ERJ3GEY0R00V	1/10W 0	1	
K7411	ERJ3GEY0R00V	1/10W 0	1	
K7502	ERJ3GEY0R00V	1/10W 0	1	
L3002	G0C271JA0019	COIL	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
L3003	G0C270JA0019	COIL 27UH	1	
L3004	G0C680JA0019	COIL	1	
L3005	G0C270JA0019	COIL 27UH	1	
L3006	G1C120JA0036	COIL	1	
L3701	G0C220JA0019	COIL 22UH	1	
L3702	G0C220JA0019	COIL 22UH	1	
L3703	G0C220JA0019	COIL 22UH	1	
L3704	G0C220JA0019	COIL 22UH	1	
L4081	G0C221KA0065	COIL	1	
L4501	G0C1R2J00004	COIL 1.2UH	1	
L4502	G0C391JA0019	COIL	1	
L4503	G0C101JA0019	COIL 100UH	1	
L5001	G0C680JA0019	COIL	1	
L6102	G0C1R5JA0019	COIL	1	
L7402	G0A100HA0023	COIL 10UH	1	
L7403	G0C2R2JA0019	COIL	1	
LB3101	J0JCC0000103	COIL	1	
LB3102	J0JCC0000103	COIL	1	
LB3103	J0JCC0000103	COIL	1	
LB3104	J0JCC0000103	COIL	1	
LB3105	J0JCC0000103	COIL	1	
LB3106	J0JCC0000103	COIL	1	
LB3107	J0JCC0000103	COIL	1	
LB3108	J0JCC0000103	COIL	1	
LB3110	J0JCC0000103	COIL	1	
LB3111	J0JCC0000103	COIL	1	
LB4101	J0JCC0000103	COIL	1	
LB4102	J0JCC0000103	COIL	1	
LB4103	J0JCC0000103	COIL	1	
LB4104	J0JCC0000103	COIL	1	
LB4105	J0JCC0000103	COIL	1	
LB4107	J0JCC0000103	COIL	1	
LB7403	ERJ3GEY0R00V	1/10W 0	1	
LB7407	ERJ3GEY0R00V	1/10W 0	1	
LB7408	J0JBC0000015	COIL	1	
LB7409	J0JBC0000015	COIL	1	
LB7410	J0JBC0000015	COIL	1	
LB7411	J0JBC0000015	COIL	1	
LB7412	J0JBC0000015	COIL	1	
LB7413	ERJ3GEY0R00V	1/10W 0	1	
P1531	K1KA02A00375	CONNECTOR(2P)	1	
P2501	K1MN07A00020	CONNECTOR(7P)	1	
P2571	K1KA08A00355	CONNECTOR(8P)	1	
P3001	K1MN09A00029	CONNECTOR(9P)	1	
P4001	K1KB02A00035	CONNECTOR(2P)	1	
P4002	K1MN06A00030	CONNECTOR(6P)	1	
P6001	K1KB19AA0032	CONNECTOR(19P)	1	
P6002	K1KB19AA0032	CONNECTOR(19P)	1	
P6003	K1KB19AA0032	CONNECTOR(19P)	1	
P6004	K1KB15AA0032	CONNECTOR(15P)	1	
P6005	K1KB11AA0032	CONNECTOR(11P)	1	
PS6001	K1KB10B00053	CONNECTOR(10P)	1	
Q1501	PNA2602M01VT	PHOTO TRANSISTOR	1	
Q1502	PNA2602M01VT	PHOTO TRANSISTOR	1	
Q3001	2SD1819A0L	TRANSISTOR	1	
Q3004	2SD1819A0L	TRANSISTOR	1	
Q4001	2SD114900L	TRANSISTOR	1	
Q4002	2SD1819A0L	TRANSISTOR	1	
Q4082	2SD0602ARL	CHIP TRANSISTOR	1	
Q4084	2SB0710A0L	TRANSISTOR	1	
Q4501	2SB0710A0L	TRANSISTOR	1	
Q4502	B1AAGD000016	TRANSISTOR	1	
Q6801	2SD1819A0L	TRANSISTOR	1	
Q7401	2SB1218A0L	TRANSISTOR	1	
Q7402	2SD1819A0L	TRANSISTOR	1	
Q7501	2SD132800L	TRANSISTOR	1	
Q7502	2SD1819A0L	TRANSISTOR	1	
Q7503	2SD1819A0L	TRANSISTOR	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
QR4001	UNR511100L	TRANSISTOR	1	
QR4082	UNR521300L	TRANSISTOR	1	
QR4501	UNR521100L	TRANSISTOR	1	
QR4801	XN0121100L	TRANSISTOR	1	
QR4802	XN0121600L	TRANSISTOR	1	
QR4803	XN0121100L	TRANSISTOR	1	
QR4804	UNR511100L	TRANSISTOR	1	
QR4805	XN0121600L	TRANSISTOR	1	
QR4806	XN0121600L	TRANSISTOR	1	
QR4807	UNR511300L	TRANSISTOR	1	
QR4808	XN0121600L	TRANSISTOR	1	
QR4809	UNR511300L	TRANSISTOR	1	
QR4814	XN0121600L	TRANSISTOR	1	
QR6801	B1GDBFNN0001	TRANSISTOR	1	
QR7401	UNR511200L	TRANSISTOR	1	
QR7502	UNR511100L	TRANSISTOR	1	
QR7503	B1GDBFNN0001	TRANSISTOR	1	
R1501	D0GB273JA007	1/10W 27K	1	
R1502	D0GB273JA007	1/10W 27K	1	
R1503	D0AE151JA048	1/4W 150	1	
R1511	D0GB273JA007	1/10W 27K	1	
R1512	D0GB273JA007	1/10W 27K	1	
R1513	ERJ6GEYJ121V	1/8W 120	1	
R2001	D0GB392JA007	1/10W 3.9K	1	
R2002	D0GB105JA007	1/10W 1M	1	
R2099	ERJ3GEYJ682V	1/10W 6.8K	1	
R2501	ERJ6GEYJ1R2V	1/8W 1.2	1	
R2502	ERJ6GEYJ1R5V	1/8W 1.5	1	
R2503	ERDS2TJ822T	1/4W 8.2K	1	
R2514	D0GB221JA041	1/10W 220	1	
R2515	D0GB221JA041	1/10W 220	1	
R2516	D0GB221JA041	1/10W 220	1	
R2520	D0GB183JA007	1/10W 18K	1	
R2521	ERJ3GEYJ102V	1/10W 1K	1	
R2551	ERJ3GEYJ103V	1/10W 10K	1	
R2552	ERJ3GEYJ103V	1/10W 10K	1	
R2561	ERJ3GEYJ102V	1/10W 1K	1	
R2562	D0GB473JA041	1/10W 47K	1	
R2563	ERJ3GEYJ102V	1/10W 1K	1	
R2564	D0GB101JA007	1/10W 100	1	
R2565	D0GB101JA007	1/10W 100	1	
R3001	D0GB152JA007	1/10W 1.5K	1	
R3002	ERJ3GEYJ622V	1/10W 6.2K	1	
R3009	D0GB153JA007	1/10W 15K	1	
R3013	ERJ3GEYJ103V	1/10W 10K	1	
R3014	ERJ3GEYJ102V	1/10W 1K	1	
R3017	ERJ3GEYJ102V	1/10W 1K	1	
R3021	D0GB222JA041	1/10W 2.2K	1	
R3022	D0GB332JA007	1/10W 3.3K	1	
R3023	D0GB152JA007	1/10W 1.5K	1	
R3030	ERJ3GEYJ685V	1/10W 6.8M	1	
R3031	D0GB331JA007	1/10W 330	1	
R3032	D0GB392JA007	1/10W 3.9K	1	
R3035	D0GB222JA041	1/10W 2.2K	1	
R3037	D0GB473JA041	1/10W 47K	1	
R3701	D0GB105JA007	1/10W 1M	1	
R3702	D0GB105JA007	1/10W 1M	1	
R3703	D0GB221JA041	1/10W 220	1	
R3704	D0GB221JA041	1/10W 220	1	
R3705	D0GB105JA007	1/10W 1M	1	
R3706	ERJ3GEYJ103V	1/10W 10K	1	
R3707	ERJ3GEYJ103V	1/10W 10K	1	
R3708	D0GB563JA007	1/10W 56K	1	
R3709	ERJ3GEYJ103V	1/10W 10K	1	
R3711	ERJ3GEYJ103V	1/10W 10K	1	
R3712	ERJ3GEYJ103V	1/10W 10K	1	
R3907	ERJ3GEYF750V	1/10W 75	1	
R3908	ERJ3GEYF750V	1/10W 75	1	
R3909	ERJ3GEYF750V	1/10W 75	1	
R3912	ERJ3GEYF750V	1/10W 75	1	
R3913	D0GB680JA007	1/10W 68	1	
R3914	ERJ3GEYF750V	1/10W 75	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R3915	ERJ3GEYF750V	1/10W 75	1	
R3924	ERJ3GEYJ750V	1/10W 75	1	
R3926	ERJ3GEYJ102V	1/10W 1K	1	
R3928	ERJ3GEYJ750V	1/10W 75	1	
R3929	ERJ3GEYJ750V	1/10W 75	1	
R4001	ERJ3GEYJ102V	1/10W 1K	1	
R4003	D0GB153JA007	1/10W 15K	1	
R4004	D0GB271JA007	1/10W 270	1	
R4005	ERJ3GEYJ102V	1/10W 1K	1	
R4006	D0GB153JA007	1/10W 15K	1	
R4007	ERJ3GEYJ103V	1/10W 10K	1	
R4008	D0GB334JA007	1/10W 330K	1	
R4011	D0GB153JA007	1/10W 15K	1	
R4012	D0GB223JA041	1/10W 22K	1	
R4081	ERJ3GEYJ103V	1/10W 10K	1	
R4082	D0GB332JA007	1/10W 3.3K	1	
R4083	ERJ3GEY0R00V	1/10W 0	1	
R4086	D0GB222JA041	1/10W 2.2K	1	
R4087	D0GB222JA041	1/10W 2.2K	1	
R4500	ERJ3GEYJ102V	1/10W 1K	1	
R4501	D0GB563JA007	1/10W 56K	1	
R4502	D0GB473JA041	1/10W 47K	1	
R4503	D0GB473JA041	1/10W 47K	1	
R4504	ERDS2TJ821T	1/4W 820	1	
R4505	ERJ3GEYJ622V	1/10W 6.2K	1	
R4506	ERJ3GEYJ622V	1/10W 6.2K	1	
R4507	D0GB472JA041	1/10W 4.7K	1	
R4508	D0GB472JA041	1/10W 4.7K	1	
R4509	D0GB473JA041	1/10W 47K	1	
R4510	ERJ3GEYJ622V	1/10W 6.2K	1	
R4511	D0GB473JA041	1/10W 47K	1	
R4512	ERJ3GEYJ622V	1/10W 6.2K	1	
R4513	D0GB472JA041	1/10W 4.7K	1	
R4515	D0GB563JA007	1/10W 56K	1	
R4518	ERJ3GEYJ753V	1/10W 75K	1	
R4519	ERJ3GEYJ753V	1/10W 75K	1	
R4520	D0GB472JA041	1/10W 4.7K	1	
R4521	ERJ3GEYJ511V	1/10W 510	1	
R4522	ERJ3GEYJ511V	1/10W 510	1	
R4525	ERJ3GEYJ102V	1/10W 1K	1	
R4526	D0GB243JA007	1/10W 24K	1	
R4527	ERJ3GEYJ682V	1/10W 6.8K	1	
R4529	ERJ3GEYJ681V	1/10W 680	1	
R4534	D0GB124JA007	1/10W 120K	1	
R4538	D0GB393JA007	1/10W 39K	1	
R4539	ERJ3GEYJ102V	1/10W 1K	1	
R4540	ERJ3GEYJ102V	1/10W 1K	1	
R4553	ERJ3GEYJ103V	1/10W 10K	1	
R4557	ERJ3GEYJ103V	1/10W 10K	1	
R4801	ERJ3GEYJ681V	1/10W 680	1	
R4802	ERJ3GEYJ681V	1/10W 680	1	
R4803	ERJ3GEYJ681V	1/10W 680	1	
R4804	ERJ3GEYJ681V	1/10W 680	1	
R4805	D0GB222JA041	1/10W 2.2K	1	
R4806	D0GB471JA041	1/10W 470	1	
R4807	D0GB471JA041	1/10W 470	1	
R4808	D0GB243JA007	1/10W 24K	1	
R4809	D0GB243JA007	1/10W 24K	1	
R4810	D0GB243JA007	1/10W 24K	1	
R4811	D0GB243JA007	1/10W 24K	1	
R4812	D0GB243JA007	1/10W 24K	1	
R4813	D0GB243JA007	1/10W 24K	1	
R4814	D0GB243JA007	1/10W 24K	1	
R4815	ERJ3GEYJ102V	1/10W 1K	1	
R4816	ERJ3GEYJ102V	1/10W 1K	1	
R4817	D0GB243JA007	1/10W 24K	1	
R4818	D0GB243JA007	1/10W 24K	1	
R4819	D0GB243JA007	1/10W 24K	1	
R4820	D0GB243JA007	1/10W 24K	1	
R4833	D0GB243JA007	1/10W 24K	1	
R4834	ERJ3GEYJ392V	1/10W 3.9K	1	
R4835	D0GB392JA007	1/10W 3.9K	1	
R4836	D0GB392JA007	1/10W 3.9K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R4837	D0GB392JA007	1/10W 3.9K	1	
R4838	D0GB392JA007	1/10W 3.9K	1	
R4841	ERJ3GEYJ473V	1/10W 47K	1	
R4842	ERJ3GEYJ473V	1/10W 47K	1	
R4843	D0GB392JA007	1/10W 3.9K	1	
R4844	D0GB392JA007	1/10W 3.9K	1	
R4845	D0GB392JA007	1/10W 3.9K	1	
R4848	D0GB243JA007	1/10W 24K	1	
R4852	D0GB243JA007	1/10W 24K	1	
R4855	D0GB243JA007	1/10W 24K	1	
R4856	D0GB243JA007	1/10W 24K	1	
R4858	D0GB221JA041	1/10W 220	1	
R4859	D0GB471JA041	1/10W 470	1	
R4860	D0GB221JA041	1/10W 220	1	
R4861	D0GB471JA041	1/10W 470	1	
R4862	D0GB104JA007	1/10W 100K	1	
R4863	D0GB104JA007	1/10W 100K	1	
R4864	ERJ3GEYJ202V	1/10W 2K	1	
R4865	ERJ3GEYJ202V	1/10W 2K	1	
R4866	ERJ3GEYJ123V	1/10W 12K	1	
R4867	ERJ3GEYJ123V	1/10W 12K	1	
R4868	ERJ3GEYJ103V	1/10W 10K	1	
R4869	ERJ3GEYJ103V	1/10W 10K	1	
R6001	ERJ3GEYJ102V	1/10W 1K	1	
R6002	ERJ3GEYJ102V	1/10W 1K	1	
R6004	ERJ3GEYJ103V	1/10W 10K	1	
R6006	D0GB183JA007	1/10W 18K	1	
R6008	D0GB222JA041	1/10W 2.2K	1	
R6009	ERJ3GEYJ103V	1/10W 10K	1	
R6010	ERJ3GEYJ103V	1/10W 10K	1	
R6012	D0GB221JA041	1/10W 220	1	
R6013	D0GB221JA041	1/10W 220	1	
R6014	ERJ3GEYJ103V	1/10W 10K	1	
R6017	D0GB222JA041	1/10W 2.2K	1	
R6020	D0GB221JA041	1/10W 220	1	
R6022	D0GB221JA041	1/10W 220	1	
R6023	D0GB221JA041	1/10W 220	1	
R6024	D0GB221JA041	1/10W 220	1	
R6026	ERJ3GEYJ103V	1/10W 10K	1	
R6027	ERJ3GEYJ103V	1/10W 10K	1	
R6028	ERJ3GEYJ103V	1/10W 10K	1	
R6029	D0GB221JA041	1/10W 220	1	
R6101	D0GB105JA007	1/10W 1M	1	
R6102	D0GB471JA041	1/10W 470	1	
R6103	D0GB181JA007	1/10W 180	1	
R6201	D0GB332JA007	1/10W 3.3K	1	
R6801	D0GB104JA007	1/10W 100K	1	
R6802	ERJ3GEY0R00V	1/10W 0	1	
R6803	D0GB474JA041	1/10W 470K	1	
R7301	ERJ3GEYJ103V	1/10W 10K	1	
R7302	ERJ3GEY0R00V	1/10W 0	1	
R7303	D0GB332JA007	1/10W 3.3K	1	
R7304	ERJ3GEY0R00V	1/10W 0	1	
R7305	ERJ6GEYJ331V	1/8W 330	1	
R7306	ERJ6GEYJ331V	1/8W 330	1	
R7307	D0GB184JA007	1/10W 180K	1	
R7308	D0GB331JA007	1/10W 330	1	
R7309	D0GB331JA007	1/10W 330	1	
R7310	ERJ3GEY0R00V	1/10W 0	1	
R7311	ERJ3GEYJ102V	1/10W 1K	1	
R7401	D0AE102JA048	1/4W 1K	1	
R7402	D0GB104JA007	1/10W 100K	1	
R7410	ERJ6GEY0R00V	1/8W 0	1	
R7411	ERJ6GEY0R00V	1/8W 0	1	
R7415	ERJ3GEYJ681V	1/10W 680	1	
R7417	D0GB472JA041	1/10W 4.7K	1	
R7418	D0GB472JA041	1/10W 4.7K	1	
R7501	D0GB101JA007	1/10W 100	1	
R7502	D0GB104JA007	1/10W 100K	1	
R7503	D0GB473JA041	1/10W 47K	1	
R7504	ERJ3GEY0R00V	1/10W 0	1	
R7505	ERJ3GEY0R00V	1/10W 0	1	
R7506	D0GB473JA041	1/10W 47K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R7508	D0GB473JA041	1/10W 47K	1	
R7511	D0GB101JA007	1/10W 100	1	
R7512	D0GB101JA007	1/10W 100	1	
R7513	D0GB101JA007	1/10W 100	1	
R7514	D0GB101JA007	1/10W 100	1	
R7515	D0GB101JA007	1/10W 100	1	
R7516	D0GB472JA041	1/10W 4.7K	1	
R7517	D0GB274JA007	1/10W 270K	1	
R7518	ERJ3GEYJ822V	1/10W 8.2K	1	
R7519	ERJ3GEYJ822V	1/10W 8.2K	1	
R7520	ERJ3GEYJ822V	1/10W 8.2K	1	
R7522	ERJ3GEYJ103V	1/10W 10K	1	
R7523	D0GB221JA041	1/10W 220	1	
R7525	ERJ3GEY0R00V	1/10W 0	1	
R7528	D0GB473JA041	1/10W 47K	1	
R7529	ERJ3GEYJ103V	1/10W 10K	1	
R7530	D0GB473JA041	1/10W 47K	1	
R7531	D0GB473JA041	1/10W 47K	1	
R7532	D0GB473JA041	1/10W 47K	1	
R7533	D0GB473JA041	1/10W 47K	1	
R7534	ERJ3GEYJ103V	1/10W 10K	1	
R7535	ERJ3GEYJ103V	1/10W 10K	1	
R7536	D0GB472JA041	1/10W 4.7K	1	
R7537	ERJ3GEYJ103V	1/10W 10K	1	
R7538	ERJ3GEY0R00V	1/10W 0	1	
R7540	D0GB473JA041	1/10W 47K	1	
R7541	ERDS2TJ561T	1/4W 560	1	
R7542	D0GB101JA007	1/10W 100	1	
R7543	ERJ3GEYJ103V	1/10W 10K	1	
R7544	ERJ3GEYJ103V	1/10W 10K	1	
R7546	ERJ3GEYJ473V	1/10W 47K	1	
R37017	ERJ3GEYJ223V	1/10W 22K	1	
S1531	K0C111A00006	SWITCH,TAB	1	
S1532	K0ZZ00000598	SWITCH,MODE	1	
T4081	G2A472C00003	VARIABLE COILS	1	⚠
TU7401	ENG56D08G1F	TUNER	1	
W701	ERJ3GEY0R00V	1/10W 0	1	
W702	ERJ3GEY0R00V	1/10W 0	1	
W703	ERJ3GEY0R00V	1/10W 0	1	
W704	ERJ6GEY0R00V	1/8W 0	1	
W705	ERJ6GEY0R00V	1/8W 0	1	
W706	ERJ6GEY0R00V	1/8W 0	1	
W707	ERJ8GEY0R00V	1/4W 0	1	
W708	ERJ8GEY0R00V	1/4W 0	1	
W709	ERJ8GEY0R00V	1/4W 0	1	
W710	ERJ8GEY0R00V	1/4W 0	1	
W711	ERJ3GEY0R00V	1/10W 0	1	
W712	ERJ8GEY0R00V	1/4W 0	1	
W713	ERJ8GEY0R00V	1/4W 0	1	
W714	ERJ8GEY0R00V	1/4W 0	1	
W715	ERJ6GEY0R00V	1/8W 0	1	
W716	ERJ8GEY0R00V	1/4W 0	1	
W717	ERJ8GEY0R00V	1/4W 0	1	
W718	ERJ8GEY0R00V	1/4W 0	1	
W719	ERJ8GEY0R00V	1/4W 0	1	
W720	ERJ8GEY0R00V	1/4W 0	1	
W721	ERJ8GEY0R00V	1/4W 0	1	
W722	ERJ6GEY0R00V	1/8W 0	1	
W723	ERJ8GEY0R00V	1/4W 0	1	
W724	ERJ8GEY0R00V	1/4W 0	1	
W725	ERJ6GEY0R00V	1/8W 0	1	
W726	ERJ8GEY0R00V	1/4W 0	1	
W727	ERJ8GEY0R00V	1/4W 0	1	
W728	ERJ8GEY0R00V	1/4W 0	1	
W729	ERJ6GEY0R00V	1/8W 0	1	
W730	ERJ8GEY0R00V	1/4W 0	1	
W731	ERJ8GEY0R00V	1/4W 0	1	
W732	ERJ8GEY0R00V	1/4W 0	1	
W733	ERJ8GEY0R00V	1/4W 0	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
W734	ERJ3GEY0R00V	1/10W 0	1	
W735	ERJ8GEY0R00V	1/4W 0	1	
W736	ERJ8GEY0R00V	1/4W 0	1	
W737	ERJ8GEY0R00V	1/4W 0	1	
W738	ERJ8GEY0R00V	1/4W 0	1	
W739	ERJ8GEY0R00V	1/4W 0	1	
W740	ERJ8GEY0R00V	1/4W 0	1	
W741	ERJ6GEY0R00V	1/8W 0	1	
W742	ERJ8GEY0R00V	1/4W 0	1	
W743	ERJ8GEY0R00V	1/4W 0	1	
W744	ERJ8GEY0R00V	1/4W 0	1	
W745	ERJ6GEY0R00V	1/8W 0	1	
W746	ERJ6GEY0R00V	1/8W 0	1	
W747	ERJ3GEY0R00V	1/10W 0	1	
W748	ERJ6GEY0R00V	1/8W 0	1	
W749	ERJ6GEY0R00V	1/8W 0	1	
W750	ERJ6GEY0R00V	1/8W 0	1	
W752	ERJ3GEY0R00V	1/10W 0	1	
W753	ERJ6GEY0R00V	1/8W 0	1	
W754	ERJ6GEY0R00V	1/8W 0	1	
W755	ERJ6GEY0R00V	1/8W 0	1	
W756	ERJ3GEY0R00V	1/10W 0	1	
W757	ERJ3GEY0R00V	1/10W 0	1	
W758	ERJ6GEY0R00V	1/8W 0	1	
W759	ERJ6GEY0R00V	1/8W 0	1	
W760	ERJ6GEY0R00V	1/8W 0	1	
W761	ERJ6GEY0R00V	1/8W 0	1	
W762	ERJ3GEY0R00V	1/10W 0	1	
W763	ERJ3GEY0R00V	1/10W 0	1	
W764	ERJ3GEY0R00V	1/10W 0	1	
W765	ERJ3GEY0R00V	1/10W 0	1	
W766	ERJ3GEY0R00V	1/10W 0	1	
W767	ERJ8GEY0R00V	1/4W 0	1	
W768	ERJ8GEY0R00V	1/4W 0	1	
W771	ERJ6GEY0R00V	1/8W 0	1	
W772	ERJ8GEY0R00V	1/4W 0	1	
W773	ERJ8GEY0R00V	1/4W 0	1	
W774	ERJ8GEY0R00V	1/4W 0	1	
W775	ERJ8GEY0R00V	1/4W 0	1	
W776	ERJ6GEY0R00V	1/8W 0	1	
W777	ERJ8GEY0R00V	1/4W 0	1	
W778	ERJ3GEY0R00V	1/10W 0	1	
W779	ERJ6GEY0R00V	1/8W 0	1	
W780	ERJ8GEY0R00V	1/4W 0	1	
W781	ERJ3GEY0R00V	1/10W 0	1	
W782	ERJ3GEY0R00V	1/10W 0	1	
W783	ERJ6GEY0R00V	1/8W 0	1	
W784	ERJ6GEY0R00V	1/8W 0	1	
W785	ERJ3GEY0R00V	1/10W 0	1	
W786	ERJ6GEY0R00V	1/8W 0	1	
W787	ERJ3GEY0R00V	1/10W 0	1	
W788	ERJ6GEY0R00V	1/8W 0	1	
W789	ERJ6GEY0R00V	1/8W 0	1	
W790	ERJ3GEY0R00V	1/10W 0	1	
W791	ERJ3GEY0R00V	1/10W 0	1	
W792	ERJ3GEY0R00V	1/10W 0	1	
W793	ERJ3GEY0R00V	1/10W 0	1	
W794	ERJ3GEY0R00V	1/10W 0	1	
W795	ERJ3GEY0R00V	1/10W 0	1	
W796	ERJ6GEY0R00V	1/8W 0	1	
W797	ERJ3GEY0R00V	1/10W 0	1	
W798	ERJ6GEY0R00V	1/8W 0	1	
W799	ERJ3GEY0R00V	1/10W 0	1	
W800	ERJ3GEY0R00V	1/10W 0	1	
W801	ERJ3GEY0R00V	1/10W 0	1	
W802	ERJ6GEY0R00V	1/8W 0	1	
W803	ERJ6GEY0R00V	1/8W 0	1	
W804	ERJ3GEY0R00V	1/10W 0	1	
W805	ERJ6GEY0R00V	1/8W 0	1	
W806	ERJ3GEY0R00V	1/10W 0	1	
W807	ERJ6GEY0R00V	1/8W 0	1	
W808	ERJ3GEY0R00V	1/10W 0	1	
W809	ERJ6GEY0R00V	1/8W 0	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
W810	ERJ3GEY0R00V	1/10W 0	1	
W811	ERJ6GEY0R00V	1/8W 0	1	
W812	ERJ6GEY0R00V	1/8W 0	1	
W813	ERJ3GEY0R00V	1/10W 0	1	
W814	ERJ3GEY0R00V	1/10W 0	1	
W815	ERJ6GEY0R00V	1/8W 0	1	
W816	ERJ3GEY0R00V	1/10W 0	1	
W817	ERJ3GEY0R00V	1/10W 0	1	
W818	ERJ3GEY0R00V	1/10W 0	1	
W819	ERJ3GEY0R00V	1/10W 0	1	
W820	ERJ3GEY0R00V	1/10W 0	1	
W821	ERJ3GEY0R00V	1/10W 0	1	
W822	ERJ3GEY0R00V	1/10W 0	1	
W823	ERJ6GEY0R00V	1/8W 0	1	
W824	ERJ3GEY0R00V	1/10W 0	1	
W825	ERJ3GEY0R00V	1/10W 0	1	
W826	ERJ6GEY0R00V	1/8W 0	1	
W827	ERJ3GEY0R00V	1/10W 0	1	
W828	ERJ6GEY0R00V	1/8W 0	1	
W829	ERJ6GEY0R00V	1/8W 0	1	
W830	ERJ6GEY0R00V	1/8W 0	1	
W831	ERJ6GEY0R00V	1/8W 0	1	
W832	ERJ3GEY0R00V	1/10W 0	1	
W833	ERJ6GEY0R00V	1/8W 0	1	
W834	ERJ3GEY0R00V	1/10W 0	1	
W835	ERJ3GEY0R00V	1/10W 0	1	
W836	ERJ6GEY0R00V	1/8W 0	1	
W837	ERJ3GEY0R00V	1/10W 0	1	
W840	ERJ3GEY0R00V	1/10W 0	1	
W841	ERJ3GEY0R00V	1/10W 0	1	
W842	ERJ3GEY0R00V	1/10W 0	1	
W843	ERJ3GEY0R00V	1/10W 0	1	
W844	ERJ3GEY0R00V	1/10W 0	1	
W845	ERJ3GEY0R00V	1/10W 0	1	
W846	ERJ6GEY0R00V	1/8W 0	1	
W847	ERJ3GEY0R00V	1/10W 0	1	
W848	ERJ6GEY0R00V	1/8W 0	1	
W849	ERJ6GEY0R00V	1/8W 0	1	
W850	ERJ6GEY0R00V	1/8W 0	1	
W851	ERJ3GEY0R00V	1/10W 0	1	
W852	ERJ3GEY0R00V	1/10W 0	1	
W853	ERJ3GEY0R00V	1/10W 0	1	
W854	ERJ3GEY0R00V	1/10W 0	1	
W855	ERJ6GEY0R00V	1/8W 0	1	
W856	ERJ8GEY0R00V	1/4W 0	1	
W857	ERJ3GEY0R00V	1/10W 0	1	
W858	ERJ3GEY0R00V	1/10W 0	1	
W859	ERJ3GEY0R00V	1/10W 0	1	
W860	ERJ3GEY0R00V	1/10W 0	1	
W861	ERJ3GEY0R00V	1/10W 0	1	
W862	ERJ3GEY0R00V	1/10W 0	1	
W863	ERJ3GEY0R00V	1/10W 0	1	
W864	ERJ6GEY0R00V	1/8W 0	1	
W866	ERJ3GEY0R00V	1/10W 0	1	
W867	ERJ3GEY0R00V	1/10W 0	1	
W868	ERJ6GEY0R00V	1/8W 0	1	
W869	ERJ6GEY0R00V	1/8W 0	1	
W870	ERJ6GEY0R00V	1/8W 0	1	
W871	ERJ6GEY0R00V	1/8W 0	1	
W872	ERJ6GEY0R00V	1/8W 0	1	
W873	ERJ6GEY0R00V	1/8W 0	1	
W874	ERJ6GEY0R00V	1/8W 0	1	
W875	ERJ6GEY0R00V	1/8W 0	1	
W876	ERJ6GEY0R00V	1/8W 0	1	
W877	ERJ3GEY0R00V	1/10W 0	1	
W878	ERJ6GEY0R00V	1/8W 0	1	
X3002	H0D357400068	CRYSTAL OSCILLATOR	1	
X6001	H0D120500009	OSCILLATOR	1	
X7501	H0D100500006	CRYSTAL OSCILLATOR	1	
X7502	H0A327200108	CRYSTAL OSCILLATOR	1	
##	VEP001P1C	SD DV INPUT P.C.B.		

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
P66802	K1MY20BA0049	CONNECTOR(20P)	1	
P66803	K2HZ104B0016	CONNECTOR(104P)	1	
P66804	K1KA06AA0083	CONNECTOR(6P)	1	
##	RFKBV0061A	DVD IF P.C.B.		
C11101	ECQU2A683MLC	100V 0.068U	1	
C11102	ECKWNA101MBV	250V 100P	1	⚠
C11103	ECKWNA101MBV	250V 100P	1	⚠
C11104	ECKWNA471MBV	250V 470P	1	
C11105	ECKWNA471MBV	250V 470P	1	
C11106	ECQU2A223MLC	0.022U	1	
C11108	F2B2E2210011	250V 220P	1	
C11109	ECKWNA102MEV	250V 1000P	1	
C11201	F1B3A4720013	4700P	1	
C11204	ECJ2VB1E104K	25V 0.1U	1	
C11205	F1J1H102A623	50V 1000P	1	
C11211	F1J1H102A623	50V 1000P	1	
C11212	ECJ2VC1H221J	50V 220P	1	
C11213	F2A1E1010103	25V 100P	1	
C11214	F1J1H222A623	50V 22U	1	
C11307	F1B3A2720001	2700P	1	
C11308	F1J1H102A623	50V 1000P	1	
C11309	ECJ2VC1H331J	50V 330P	1	
C11310	F2A1V6800002	35V 68P	1	
C11311	ECJGVB1H392K	50V 3900P	1	
C11401	F2A1C2220080	16V 2200P	1	
C11403	F2A1C5610006	16V 560U	1	
C11512	ECJ2VB1E104K	25V 0.1U	1	
C11513	ECJ2VB1E473K	25V 0.047U	1	
C11601	F1K1C106A062	16V 10U	1	
C11603	F2A1C1210017	16V 120P	1	
C11604	F2A1C1210017	16V 120P	1	
C11605	F1J1C105A091	16V 1U	1	
C11606	ECJ2VB1E104K	25V 0.1U	1	
C11607	ECJ2VB1E104K	25V 0.1U	1	
C11608	ECJ2VC1H181J	50V 180P	1	
C11610	F1J1H103A702	50V 0.01U	1	
C11613	F2A1C4710079	10V 470U	1	
C11618	F1J1C105A091	16V 1U	1	
C11701	F2A1A2220055	10V 2200P	1	
C11703	F2A1C5610006	16V 560U	1	
C11704	F2A1H5600018	50V 56U	1	
C11705	F2A1C1210017	16V 120P	1	
C11706	F2A1H5600018	50V 56U	1	
C11707	F2A1C1210017	16V 120P	1	
C11709	F2A1A6810022	10V 680U	1	
C11711	ECJ2VB1E104K	25V 0.1U	1	
C11712	ECJ2VB1E473K	25V 0.047U	1	
C11720	F1J1C105A091	16V 1U	1	
C11721	F1J1C105A091	16V 1U	1	
C11722	F1J1H103A702	50V 0.01U	1	
C11801	F2A1C1210017	16V 120P	1	
C11802	ECJ2VB1E104K	25V 0.1U	1	
C11803	ECJ2VB1E104K	25V 0.1U	1	
C11804	ECJ2VB1E104K	25V 0.1U	1	
C11805	ECJ2VC1H181J	50V 180P	1	
C11806	F1J1H103A702	50V 0.01U	1	
C11807	F2A1A6810022	10V 680U	1	
C31504	F1H0J1050010	6.3V 1U	1	
C31505	F1H0J1050010	6.3V 1U	1	
C31506	F1H0J1050010	6.3V 1U	1	
C31507	F1H0J1050010	6.3V 1U	1	
C31508	F1H1H103A219	50V 0.01U	1	
C33501	ECEA0JKN470B	6.3V 47U	1	
C33502	ECEA0JKN470B	6.3V 47U	1	
C33503	F1H1H103A219	50V 0.01U	1	
C33505	ECEA0JKN470B	6.3V 47U	1	
C37001	ECA1CAK220XB	16V 22P	1	
C37005	F1H1H101A230	50V 100P	1	
C37006	F1H1H101A230	50V 100P	1	
C37010	F1H1H101A230	50V 100P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C37011	F1H1C104A041	16V 0.1U	1	
C37012	F1H1C104A041	16V 0.1U	1	
C37013	F1H1C104A041	16V 0.1U	1	
C37501	ECJ1VB1C104K	16V 0.1U	1	
C45001	F1H1C104A008	16V 0.1U	1	
C45003	ECQV1H104JL3	50V 0.1U	1	
C45004	F2A0J471A247	6.3V 470U	1	
C45007	ECA1CAK100XB	16V 10U	1	
C45008	ECA1CAK100XB	16V 10U	1	
C45011	F1H1H102A219	50V 1000P	1	
C45012	F1H1H102A219	50V 1000P	1	
C45013	F2A1C470A698	16V 47U	1	
C45014	F2A1C470A698	16V 47U	1	
C45017	ECA1CAK100XB	16V 10U	1	
C45018	ECA1CAK100XB	16V 10U	1	
D11101	B0EBKT000008	DIODE	1	
D11102	B0AAGR000003	DIODE	1	
D11201	MAZ73000BC	DIODE	1	
D11203	MA2J11100L	DIODE	1	
D11205	MA2J11100L	DIODE	1	
D11209	B0AADM000003	DIODE	1	
D11210	B0AADM000003	DIODE	1	
D11212	B0BC9R000008	DIODE	1	
D11303	MAZ73000BC	DIODE	1	
D11304	MA2J11100L	DIODE	1	
D11305	B0AADM000003	DIODE	1	
D11306	B0BC8R100004	DIODE	1	
D11401	B0JCNG000003	DIODE	1	
D11402	B0JCNG000003	DIODE	1	
D11504	MA2J11100L	DIODE	1	
D11505	MA2J11100L	DIODE	1	
D11602	B0JCPD000021	DIODE	1	
D11701	B0JAMG000010	DIODE	1	
D11702	B0JAMG000010	DIODE	1	
D11703	B0AADM000003	DIODE	1	
D11704	B0AADM000003	DIODE	1	
D11705	B0JAME000025	DIODE	1	
D11706	B0JAQE000004	DIODE	1	
D11720	B0EAKL000062	DIODE	1	
D11721	B0EAKL000062	DIODE	1	
D11722	B0AACK000004	DIODE	1	
D11723	B0AACK000004	DIODE	1	
D11801	B0JCPD000021	DIODE	1	
D37001	B0AACK000004	DIODE	1	
F11101	K5D202BK0005	FUSE	1	⚠
IC11201	C0DACZH00031	IC	1	
IC11301	C0DACZH00030	IC	1	
IC11502	C0DAEMB00003	IC	1	
IC11601	C0DBAZZ00131	IC	1	
IC11701	C0DAEMB00003	IC	1	
IC11720	C0CBCBD00048	IC	1	
IC11801	C0DBAKG00007	IC	1	
IC31501	C0CBCDC00052	IC	1	
IC31503	C0CBCBD00048	IC	1	
IC37001	C0ABBA000146	IC	1	
IC37501	RFKFM6016K	IC	1	(PAVC-CSG)
IC45001	C0DBAHD00013	IC	1	
IP11201	K5H5012A0010	IC PROTECTOR	1	⚠
IP11702	K5H1022A0011	IC PROTECTOR	1	⚠
IP11703	K5H1022A0011	IC PROTECTOR	1	⚠
K31501	ERJ3GEY0R00V	1/10W 0	1	
K45003	ERJ3GEY0R00V	1/10W 0	1	
K45004	ERJ3GEY0R00V	1/10W 0	1	
L11101	G0B832L00001	COIL	1	
L11102	G0B832L00001	COIL	1	
L11401	G0A100H00025	COIL 10UH	1	
L11601	G0A220GA0026	COIL 22UH	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
L11602	G0A100HA0023	COIL 10UH	1	
L11603	G0A150ZA0030	COIL	1	
L11701	G0A100HA0023	COIL 10UH	1	
L11703	G0A100HA0023	COIL 10UH	1	
L11704	G0A100HA0023	COIL 10UH	1	
L11801	G0A220ZA0030	COIL 22UH	1	
LB11101	J0JKB0000003	COIL	1	
LB11102	J0JKB0000003	COIL	1	
LB11103	J0JHC0000048	FILTER	1	
LB11201	J0JHC0000048	FILTER	1	
LB11301	J0JHC0000048	FILTER	1	
LB11601	J0JHC0000048	FILTER	1	
LB11701	J0JHC0000048	FILTER	1	
LB11702	J0JHC0000048	FILTER	1	
LB11703	J0JHC0000048	FILTER	1	
LB11801	J0JHC0000048	FILTER	1	
LB37001	J0JHC0000048	FILTER	1	
LB37002	J0JHC0000048	FILTER	1	
LB37003	J0JHC0000048	FILTER	1	
LB37004	J0JHC0000048	FILTER	1	
LB37005	J0JKB0000032	FILTER	1	
LB37006	ERJ3GEY0R00V	1/10W 0	1	
LB37007	ERJ3GEY0R00V	1/10W 0	1	
LB37008	ERJ3GEY0R00V	1/10W 0	1	
LB37009	J0JKB0000032	FILTER	1	
LB37010	ERJ3GEY0R00V	1/10W 0	1	
LB37011	J0JKB0000032	FILTER	1	
LB37012	ERJ3GEY0R00V	1/10W 0	1	
LB37013	J0JKB0000032	FILTER	1	
LB37014	J0JKB0000032	FILTER	1	
LB45001	J0JCC0000103	COIL	1	
P11101	K2AB2B000008	AC INLET	1	⚠
P31901	K1KA11A00124	CONNECTOR(11P)	1	
P31902	K1KA15A00118	CONNECTOR(15P)	1	
P31903	K1KA19A00007	CONNECTOR(19P)	1	
P31904	K1KA19A00007	CONNECTOR(19P)	1	
P31905	K1KA19A00007	CONNECTOR(19P)	1	
P37001	K1KA03AA0180	CONNECTOR(3P)	1	
P37101	K1KY64A00002	CONNECTOR(64P)	1	
PS31901	K1KB12B00040	CONNECTOR(FEMALE) 12P	1	
Q11101	B3PBA0000237	TRANSISTOR	1	
Q11301	B3PBA0000237	TRANSISTOR	1	
Q11502	2SD0601AHL	CHIP TRANSISTOR	1	
Q11601	B1DHED000008	TRANSISTOR	1	
Q11602	B1DHDD000022	TRANSISTOR	1	
Q11801	B1DHDD000022	TRANSISTOR	1	
Q37001	2SD0874A0L	TRANSISTOR	1	
Q37501	B1CFHC000003	CHIP TRANSISTOR	1	
Q37502	B1CFHC000003	CHIP TRANSISTOR	1	
Q37503	2SD1819A0L	TRANSISTOR	1	
Q37505	2SD1819A0L	TRANSISTOR	1	
Q37506	2SD1819A0L	TRANSISTOR	1	
Q37507	B1CFHC000003	CHIP TRANSISTOR	1	
QR11501	UNR521100L	TRANSISTOR	1	
QR11601	UNR521300L	TRANSISTOR	1	
QR11602	UNR521300L	TRANSISTOR	1	
QR11603	UNR521300L	TRANSISTOR	1	
R11201	ERJ6GEYJ473V	1/8W 47K	1	
R11202	ERJ6GEYJ103V	1/8W 10K	1	
R11203	ERJ6GEYG133V	1/8W 13K	1	
R11204	ERJ6GEYG152V	1/10W 1.5K	1	
R11208	ERJ6GEYJ100V	1/8W 10	1	
R11217	ERJ6GEYJ100V	1/8W 10	1	
R11218	ERJ6GEYJ100V	1/8W 10	1	
R11219	ERJ6GEYJ100V	1/8W 10	1	
R11220	ERJ6GEYJ912V	1/10W 9.1K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R11222	ERJ6GEYG361V	1/10W 360	1	
R11223	ERJ6GEYG682V	1/8W 6.8K	1	
R11307	ERJ6GEYJ103V	1/8W 10K	1	
R11308	ERJ6GEYG203V	1/8W 20K	1	
R11309	ERJ6GEYG102V	1/8W 1K	1	
R11321	ERJ6GEYJ100V	1/8W 10	1	
R11322	ERJ6GEYJ100V	1/8W 10	1	
R11323	ERJ6GEYJ123V	1/8W 12K	1	
R11324	ERJ6GEYG201V	1/8W 200	1	
R11325	ERJ6GEYG562V	1/8W 5.6K	1	
R11506	ERJ6GEYJ242V	1/10W 2.4K	1	
R11507	ERJ6GEYJ102V	1/8W 1K	1	
R11508	ERJ6GEYJ103V	1/8W 10K	1	
R11509	ERJ6GEYJ102V	1/8W 1K	1	
R11510	ERJ6GEYG563V	1/10W 56K	1	
R11511	ERJ6GEYJ103V	1/8W 10K	1	
R11512	ERJ6GEYG242V	1/8W 2.4K	1	
R11513	ERJ6GEYG301V	1/10W 300	1	
R11514	ERJ6GEYG912V	1/8W 9.1K	1	
R11515	ERJ6GEYJ472V	1/8W 4.7K	1	
R11601	ERJ6GEYJ472V	1/8W 4.7K	1	
R11602	ERJ6GEYJ472V	1/8W 4.7K	1	
R11604	ERJ6GEYJ513V	1/8W 51K	1	
R11605	D1BFR0150001	1/2W 0.015	1	
R11606	ERJ6RBD153V	1/10W 15K	1	
R11607	ERJ6RBD911V	1/10W 910	1	
R11608	ERJ6RBD512V	1/10W 5.1K	1	
R11610	ERJ6GEYJ103V	1/8W 10K	1	
R11701	ERJ6GEYJ391V	1/8W 390	1	
R11702	ERJ6GEYJ102V	1/8W 1K	1	
R11703	ERJ6GEYJ332V	1/8W 3.3K	1	
R11704	ERJ6GEYJ223V	1/8W 22K	1	
R11706	ERJ6GEYG242V	1/8W 2.4K	1	
R11707	ERJ6GEYG821V	1/8W 820	1	
R11708	ERJ6GEYG101V	1/8W 100	1	
R11709	ERJ6GEYG242V	1/8W 2.4K	1	
R11801	ERJ6GEYJ513V	1/8W 51K	1	
R11802	D1BFR0270001	1/2W 0.027	1	
R11803	ERJ6RBD221V	1/8W 220	1	
R11804	ERJ6RBD223V	1/8W 2.3K	1	
R11805	ERJ6RBD562V	1/8W 5.6K	1	
R11807	ERJ6GEYJ471V	1/8W 470	1	
R33501	ERJ3RBD472V	1/10W 4.7K	1	
R33502	ERJ3RBD472V	1/10W 4.7K	1	
R33503	ERJ3RBD472V	1/10W 4.7K	1	
R33504	ERJ3RBD472V	1/10W 4.7K	1	
R33505	ERJ3RBD472V	1/10W 4.7K	1	
R37001	D0GB183JA007	1/10W 18K	1	
R37002	ERJ3GEYJ103V	1/10W 10K	1	
R37003	D0GB821JA007	1/10W 820	1	
R37004	D0GB101JA007	1/10W 100	1	
R37005	D0GB101JA007	1/10W 100	1	
R37006	D0GB101JA007	1/10W 100	1	
R37007	D0GB101JA007	1/10W 100	1	
R37008	D0GB473JA041	1/10W 47K	1	
R37009	D0GB101JA007	1/10W 100	1	
R37010	D0GB101JA007	1/10W 100	1	
R37012	D0GB473JA041	1/10W 47K	1	
R37014	D0GB101JA007	1/10W 100	1	
R37015	ERJ3GEY0R00V	1/10W 0	1	
R37016	ERJ3GEY0R00V	1/10W 0	1	
R37017	ERJ3GEYJ472V	1/10W 4.7K	1	
R37502	ERJ3GEYJ472V	1/10W 4.7K	1	
R37503	ERJ3GEYJ472V	1/10W 4.7K	1	
R37504	D0GB472JA041	1/10W 4.7K	1	
R37505	D0GB472JA041	1/10W 4.7K	1	
R37508	ERJ3GEYJ103V	1/10W 10K	1	
R37509	D0GB472JA041	1/10W 4.7K	1	
R37510	ERJ3GEYJ103V	1/10W 10K	1	
R37511	D0GB472JA041	1/10W 4.7K	1	
R37513	D0GB473JA041	1/10W 47K	1	
R37514	D0GB473JA041	1/10W 47K	1	
R37515	D0GB473JA041	1/10W 47K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R45001	ERJ3GEY0R00V	1/10W 0	1	
R45002	ERJ3GEY0R00V	1/10W 0	1	
R45008	ERJ3GEYJ102V	1/10W 1K	1	
R45009	ERJ3GEYJ102V	1/10W 1K	1	
R45014	D0GB473JA041	1/10W 47K	1	
R45015	D0GB473JA041	1/10W 47K	1	
R45016	D0GB221JA041	1/10W 220	1	
T11101	G4D2A0000267	TRANSFORMER	1	⚠
T11301	G4D2A0000268	TRANSFORMER	1	⚠
VA11101	ERZVA5V471	SURGE ABSORBER	1	⚠
W302	ERJ3GEY0R00V	1/10W 0	1	
W303	ERJ3GEY0R00V	1/10W 0	1	
W304	ERJ3GEY0R00V	1/10W 0	1	
W305	ERJ3GEY0R00V	1/10W 0	1	
W306	ERJ6GEY0R00V	1/8W 0	1	
W307	ERJ6GEY0R00V	1/8W 0	1	
W308	ERJ6GEY0R00V	1/8W 0	1	
W309	ERJ3GEY0R00V	1/10W 0	1	
W310	ERJ3GEY0R00V	1/10W 0	1	
W311	ERJ6GEY0R00V	1/8W 0	1	
W312	ERJ6GEY0R00V	1/8W 0	1	
W313	ERJ6GEY0R00V	1/8W 0	1	
W314	ERJ3GEY0R00V	1/10W 0	1	
W315	ERJ6GEY0R00V	1/8W 0	1	
W316	ERJ6GEY0R00V	1/8W 0	1	
W317	ERJ6GEY0R00V	1/8W 0	1	
W320	ERJ6GEY0R00V	1/8W 0	1	
W321	ERJ3GEY0R00V	1/10W 0	1	
ZA11101	EYF52BCY	FUSE HOLDER	1	
ZA11102	EYF52BCY	FUSE HOLDER	1	
##	VEPV0057A	FRONT JACK P.C.B.		(RTL)
C3801	F1H1H103A220	50V 0.01U	1	
C3802	F1H1C104A008	16V 0.1U	1	
JK3802	K1AY106A0002	JACK,S VIDEO IN	1	
JK4600	K2HA307A0009	JACK,IN 2	1	
LB3301	ERJ3GEY0R00V	1/10W 0	1	
LB3302	ERJ3GEY0R00V	1/10W 0	1	
LB3303	ERJ3GEY0R00V	1/10W 0	1	
PP4801	K1KA10B00196	CONNECTOR(10P)	1	
R3801	ERJ3GEYJ750V	1/10W 75	1	
R3802	ERJ3GEYJ750V	1/10W 75	1	
R3803	ERJ3GEYJ750V	1/10W 75	1	
R3804	ERJ3GEYJ102V	1/10W 1K	1	
R4305	ERJ3GEY0R00V	1/10W 0	1	
R4306	ERJ3GEY0R00V	1/10W 0	1	
R7801	D0GB392JA007	1/10W 3.9K	1	
R7802	D0GB392JA007	1/10W 3.9K	1	
R7803	D0GB392JA007	1/10W 3.9K	1	
R7804	D0GB272JA007	1/10W 2.7K	1	
R7805	D0GB272JA007	1/10W 2.7K	1	
R7806	ERJ3GEYJ822V	1/10W 8.2K	1	
S7801	EVQ11G07K	SWITCH,CH-DOWN	1	
S7802	EVQ11G07K	SWITCH,REW	1	
S7803	EVQ11G07K	SWITCH,CH-UP	1	
S7806	EVQ11G07K	SWITCH,POWER	1	
S7810	EVQ11G07K	SWITCH,FF	1	
S7813	EVQ11G07K	SWITCH,EJECT	1	
W550	ERJ3GEY0R00V	1/10W 0	1	
W551	ERJ3GEY0R00V	1/10W 0	1	
##	VEPV0058A	FRONT P.C.B.		(RTL)

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C7701	F1H1C104A008	16V 0.1U	1	
D7702	B3ADA0000183	DIODE	1	
D7703	B3ACA0000252	LED	1	
D7706	B3AAA0000752	DIODE	1	
IC7701	B3RAD0000122	IR RECEIVER	1	
PP7702	K1KA12B00129	CONNECTOR(12P)	1	
Q7702	2SD0601A0L	TRANSISTOR	1	
Q7703	2SD0601A0L	TRANSISTOR	1	
Q7706	2SD0601A0L	TRANSISTOR	1	
R7703	D0GB152JA007	1/10W 1.5K	1	
R7704	D0GB152JA007	1/10W 1.5K	1	
R7705	D0GB391JA041	1/10W 390K	1	
R7706	D0GB391JA041	1/10W 390K	1	
R7707	D0GB222JA041	1/10W 2.2K	1	
R7710	D0GB221JA041	1/10W 220	1	
R7714	D0GB152JA007	1/10W 1.5K	1	
R7715	ERJ3GEYJ271V	1/10W 270	1	
R7716	D0GB104JA007	1/10W 100K	1	
R7718	D0GB104JA007	1/10W 100K	1	
R7719	D0GB104JA007	1/10W 100K	1	
S7702	EVQ11G07K	SWITCH,DVD	1	
S7703	EVQ11G07K	SWITCH,REC	1	
S7704	EVQ11G07K	SWITCH,PLAY	1	
S7705	EVQ11G07K	SWITCH,STOP	1	
S7706	EVQ11G07K	SWITCH,SELECT	1	
S7707	EVQ11G07K	SWITCH,OPEN/CLOSE	1	
S7711	EVQ11G07K	SWITCH,VHS	1	
W444	ERJ3GEY0R00V	1/10W 0	1	
W445	ERJ3GEY0R00V	1/10W 0	1	
W446	ERJ3GEY0R00V	1/10W 0	1	
W447	ERJ3GEY0R00V	1/10W 0	1	
##		CASING/ACCESSORY/PACKING		
1	VEP001P1C	SD-DV INPUT P.C.B.	1	(RTL)
2	VEPV0054BT	MAIN P.C.B.	1	(RTL)
4	VEPV0057A	FRONT JACK P.C.B.	1	(RTL)
5	VEPV0058A	FRONT P.C.B.	1	(RTL)
6	RFKBV0061A	DVD IF P.C.B.	1	(RTL)
7	K4ZZZZ000008	GASKET	1	
8	L6FALCCE0016	FAN MOTOR	1	
9	RHD30111-3	SCREW	19	
10	RHD30113	SCREW	4	
11	RHDC0023	SCREW	3	
13	RMQ1513	HEAT TRANSFER SHEET	1	
14	RMX0354	MECHA SPACER(F)	1	
15	RMX0355	MECHA SPACER(R)	1	
16	RMZ0776	CELL COVER	1	
17	RMZ0791	BARRIER	1	
18	RMZ0839-1	BARRIER	1	
19	RKA0178-X	LEG	2	
20	VKA0382	LEG CUSHION	2	
21	RMC0672	PLATE SPRING	1	
22	RMY0357	HEAT SINK	1	
23	RYPV0149-S	FRONT PANEL ASS'Y	1	ES35VP
23	RYPV0150-S	FRONT PANEL ASS'Y	1	ES35VPC
23-1	RGUV0148-S	DUB BUTTON	1	
23-2	RHD26045-L	SCREW	10	
23-3	RKWV0063-Q1	FR WINDOW	1	
23-4	RKWV0061-Q1	FRONT WINDOW	1	
23-5	RGKV0143-H1	SD SLOT	1	
23-6	RKFV0058-S1	SD DOOR	1	
23-7	RMB0821-1	SD SPRING	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
23-8	RKFV0056-S1	TRAY DOOR	1	
23-9	RKFV0057-S	BLINDER PANEL	1	
23-10	RMB0857	TRAY DOOR SPRING	1	
23-11	RMRV0039	TRAY DOOR STOPPER	1	
23-12	VMB2521	BLINDER SPRING	1	
23-13	RGUV0146-S	EJECT BUTTON	1	
23-14	RGUV0147-S	OPEN BUTTON	1	
24	VGQ8142	RIVET	1	
25	RHD30119-S	SCREW	11	
26	VHD1770	SCREW	1	
27	VJF0036	NYLON RIVET	2	
28	RWJV0047	FFC(20P)	1	
30	RWJV0033	FFC(7P)	1	
31	RWJV0034	FFC(6P)	1	
32	VKC0295	PCB HOLDER	2	
34	XTV26+5FFJ	SCREW	1	
35	XTW3+10PN	SCREW	1	
38	RKM0588-S	TOP CASE	1	⚠
39	XSN3+4FJ	SCREW	1	
40	RGRV0050B-A3	REAR PANEL	1	ES35VP ⚠
40	RGRV0050B-B3	REAR PANEL	1	ES35VPC ⚠
41	RFKNES35VP	RAM/DIGITAL P.C.B. MODULE	1	ES35VP(RTL)
41	RFKNES35VPC	RAM/DIGITAL P.C.B. MODULE	1	ES35VPC(RTL)
45	RMAV0036	DIGITAL ANGLE	1	
46	RMBV0047	EARTH SPRING	1	
101	VEG1697KIT	RDD CYLINDER ASS'Y	1	
101-1	VMD5464	FPC HOLDER	1	
102	VEM0800T	CAPSTAN MOTOR	1	
103	L1AZ00000004	FE HEAD ASS'Y	1	
104	VDB1431	TENSION ARM BOSH	1	
105	VDG1686	INTERMEDIATE GEAR	1	
106	VDG1685	MAIN CAM GEAR	1	
107	VDG1512-1	IDLER GEAR	2	
108	VDG1514-3	CHANGE GEAR	1	
109	VDR0372A	REEL TABLE	2	
110	VDV0391-2	CAPSTAN BELT	1	
111	VEM0797	LOADING MOTOR	1	
112	VMB3550A	CHANGING GEAR SPRING	1	
113	VMD4987	WORM SHAFT HOLDER	1	
114	VMD5466	OPENER PIECE	1	
115	VMD4253-1	LED PRISM	1	
116	VML3934	MAIN LEVER	1	
117	VML3933	PINCH CHARGE ARM	1	
118	VML3632	IDLER ARM	1	
119	VMX3092	P4 CAP	1	
120	VXA7105-3	S SHAFT HOLDER	1	
121	VXA7106-3	T SHAFT HOLDER	1	
122	L1AE00000044	AC HEAD ASS'Y	1	
122-1	VHD1066-2	SCREW	2	
122-2	VHD1185	SCREW	1	
124	VXL3107	S LOADING ARM	1	
125	VXL3108	T LOADING ARM	1	
126	VXL3109-7	PINCH ARM UNIT	1	
127	VXL3110	P5 ARM	1	
128	VXL3111-1	TENSION ARM	1	
129	VXL3252	S BRAKE ARM	1	
130	VXL3343	T BRAKE ARM	1	
130-1	VMB3548-2A	T BRAKE SPRING	1	
131	VXL3124-2	CHANGING LEVER UNIT	1	
132	VXP2133-2	CENTER CLUTH UNIT	1	
133	VXP2168	TORQUE CLUTCH	1	
134	VMA0L25	TOP PLATE	1	
135	VMD5468	SIDE PLATE(L)	1	
136	VMD5469	SIDE PLATE(R)	1	
137	VXA8265	CASSETTE HOLDER UNIT	1	
138	VXL3160	MAIN SHAFT	1	
139	VXA8323	SECTOR GEAR	1	
141	VML3706-3	OPENER LEVER	1	
142	VHD1044-1	SCREW	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
143	XYN3+C4FJ	SCREW	1	
144	XTN26+7JFJ	SCREW	3	
145	XTV26+5FFJ	SCREW	2	
146	XTV26+8FFJ	SCREW	2	
148	VHD1117-1	SCREW	3	
149	VMX2208	WASHER	1	
150	VMX3114	WASHER	1	
151	VMX2699	WASHER	1	
152	VMX3196	WASHER	1	
A1	EUR7659Y70	REMOTE CONTROL ASS'Y	1	
A1-1	UR76EC5903A	BATTERY COVER	1	
A2	VFA0461	AC CORD	1	⚠
A3	K2KA6BA00003	AV CORD	1	
A4	K2KZ2BA00001	RF COAXIAL CABLE	1	
A5	VPK2737	ACCESSORY CASE	1	
A6	RQTV0134-2	OPERATING INSTRUCTIONS	1	(IA) ⚠
A6	RQTV0135	OPERATING INSTRUCTIONS	1	ES35VPC(IB) ⚠
A7	RQCAV0007	SET-UP GUIDE	1	
A8	RPFX0042-2	VINYL BAG(F.B)	1	
PC1	RPG7876-1	PACKING CASE	1	ES35VP
PC1	RPG7877-1	PACKING CASE	1	ES35VPC
PC2	RPN1860	CUSHION	1	
PC3	VPF1122-1	POLYETHYLENE BAG	1	